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ANALYZING CAPABILITIES OF CRM SYSTEM AS A RESOURCE FOR PERFORMANCE ENABLEMENT OF AFTER SALES SERVICES FUNCTION

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ABSTRACT

Moiz Rehman: Analyzing capabilities of CRM system as a resource for performance enablement of after sales services function
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Servitization is a strategic change process in organizations that enables revenue generation through the provision of services associated with traditional goods. This includes aftersales services such as repair and maintenance. The manufacturing companies are increasingly implementing this strategy to fulfill their financial, marketing and strategic business objectives. The adoption of servitization presents some challenges to these companies related to service design, organization strategy and organization transformation. Therefore, it is important for them to realign and reallocate their resources to support the new service focused business model. Moreover, customer intimacy is a key element behind success of servitization strategy. This requires these firms to develop new customer related capabilities through resources such as CRM systems and leverage those capabilities with the purpose of value creation for customers and fulfillment of desired business objectives.

The objective of this study was to identify the capabilities offered by CRM systems that could help the aftersales service function to achieve its business objectives. This study was conducted for a case company which was in the process of implementing a CRM system in their aftersales function as a work management tool. Both theoretical and empirical research were conducted to meet the research objective. The theoretical research was completed through a literature review focusing on various topics including servitization, aftersales service and CRM systems. The empirical data was primarily collected by conducting qualitative semi structured interviews with employees and observation of CRM pilot project at the case company. The analysis of interviews and observation was conducted inductively, and results were summarized and grouped according to the research question themes.

The answers to research questions were obtained by combining literature review and the empirical findings of the study. The business objectives and associated challenges of the aftersales service function were identified first, followed by recognition of capabilities required for the performance improvement of aftersales service function. Finally, different capabilities offered by CRM systems were highlighted. It was found that CRM systems offer key capabilities such as contact management, collaboration, case management and reporting and analytics. These capabilities could help to meet the capability requirements of the aftersales service function and achieve its business objectives. The recommendations for using 7 CRM capabilities in the aftersales service function were developed for the case company. Moreover, practical limitations and challenges associated with these were also highlighted.

Keywords: Servitization, After sales service, CRM systems, CRM capabilities, business objectives

PREFACE

This study was completed for Metso Minerals Oy while working in the Global Quotation Support team. The research was done during the implementation of Customer Relationship management (CRM) system in the function. This provided a chance to learn about CRM systems and participate in the development activities.

I would like to thank Alisha Neville and Tommi Koski from Metso for their guidance and support throughout the research. They helped to define the scope of the thesis and find participants for the interview from various company locations. They also provided many valuable ideas and materials throughout the process. I am also grateful to the colleagues who participated in the interviews and have immensely contributed to this research.

Moreover, I would like to thank Associate Professor Teemu Laine from Tampere University for supervising my thesis and guiding me during the research process. His ideas and feedback were very important to make progress with the thesis and provide the best possible results. Finally, I would like to thank my family and friends for their support during this journey.

Tampere, 07 November 2019

Moiz Rehman

CONTENTS

LIST OF FIGURES AND TABLES

LIST OF SYMBOLS AND ABBREVIATIONS

ASS	After Sales Services
ASP	Aftersales Service Provider
B2B	Business to Business
CRM	Customer Relationship Management
CSP	Customer Service Provider
CSR	Customer Service Representative
DP	Development Partner
ERP	Enterprise Resource Planning
GQS	Global Quotation Support
OP	Outsourcing Partner
KMC	Knowledge Management Capability
KPI	Key Performance Indicator
RBV	Resource Based View

1. INTRODUCTION

1.1. Research motivation

The business models of most product centric firms around the world signify a shift towards “service infusion in manufacturing”. These firms are adopting capabilities and procedures to enrich their value proposition by amalgamating innovative products and services. Integrated product-service offerings help these firms to sustain strategic competition through differentiation and provide competitive advantage within the manufacturing sector market (Wise and Baumgartner, 1999). Moreover, inclusion of services also augments firm’s profitability and satisfies customer needs better (Quinn et al., 1990). Vandermerwe and Rada (1988) coined this phenomenon of service adoption by firms as “Servitization”.

According to Vander Merwe and Rada (1988), servitization can include provision of goods, services, support, self-service and knowledge that are coupled together to add value to primary product offerings. The services usually offered by product centric companies comprise of customer service such as logistics support, claim management and product related service such as maintenance, repair or spare part recommendation (Fischer et al., 2010). Successful delivery of these services entails the firm to adopt new principles, structures and processes (Oliva and Kallenberg, 2003). This shows the importance of new organizational functions such as aftersales service which have been recently developed in different firms. These functions are separate entities that support main organizational activities and signify a more service-oriented approach leading towards enhanced revenue generation and profitability.

Furthermore, servitization process features very strong customer centricity (Baines et al., 2009), as organization focuses on providing a more tailored solution to fulfill customer needs. The nature of customer interaction in the organization shifts from a product selling transaction to establishing and maintaining a relationship with the customer (Oliva and Kallenberg, 2003). Therefore, it is important that organizational functions should be equipped with necessary resources to build capabilities and leverage those capabilities with the purpose of creating and maintaining value for customers and fulfilling desired business objectives.

An important strategic approach increasingly adopted by organizations to support the servitization process is Customer Relationship Management (CRM). Payne and Frow (2005) commend that the purpose of CRM is to help develop and maintain relationships with customers often using information technology. A CRM system enables the organizations to use data and information for understanding customers and adding mutual value in the relationship through captivating opportunities. Investments on CRM systems were forecasted to be $23.9 billion in 2014 (Gartner, 2014). This figure is likely to increase in recent time as studies suggest that CRM systems provide numerous benefits to an organization. These include increase in customer knowledge (Mithas et al., 2005) and improved customer satisfaction and retention (Boulding et al., 2005).

Researchers and practitioners are inclined to investigate how CRM capability facilitates performance of organizational functions. According to Chang et al. (2010), empirical research has disparity on the notion that CRM technology enhances performance of the organization. The generic purpose of a CRM system is assumed to be supporting sales force (Meuter et al., 2000). These systems have traditionally been used by the sales function only. Although leading CRM vendors like Salesforce claim that some of the wider gains of CRM systems can come in other organizational functions such as customer service and aftersales service support. There is a need to investigate how CRM capability translates into accomplishment of business objectives of organizational functions in the perspective of servitization. In this study, the focus is put on aftersales services function of the case company.

1.2. Research context and the case company

This study is being carried for Metso Minerals Oy located in Tampere, Finland. The company is one of the biggest manufacturers of aggregate and mining crushers with presence in over 50 countries. Metso Minerals Oy has an expanded installed base around the globe, and it strives to satisfy and retain its customers with value added offerings. As the company continues to evolve as a servitized business entity, it is incorporating new organizational functions and acquiring novel resources to achieve its business objectives. Services accounted for 56% of Metso's revenue in 2018. The Global Quotation Support (GQS) is one of the key departments in aftersales service function of the organization that provides technical support to the customers regarding spare parts and helps in the development of quotations for customers from all market areas. The requests are received through the customer representatives and are handled by a team of specialists. This department ensures that customer is offered the correct spare part every time at the best possible price. Thus, it also safeguards that the company converts its leads into

sales at the same time satisfying customers and retaining profitability. The company is determined to improve the performance of this department by enhancing its capability and increasing its efficiency and quality that would generate more sales and augment customer satisfaction.

Moreover, the company is also in the process of implementing a new CRM system within this aftersales service function to manage the workflow and support the performance improvement initiative. A similar CRM system has been used previously in the sales only. At this point, it is very crucial for the company to recognize the capabilities of this CRM system and how these could enable the performance of aftersales services function that would ultimately benefit the business. Furthermore, the company is also interested to explore future implications of this CRM system in the context of servitization.

1.3. Research objective and questions

The main objective of this study is to outline the capabilities of a CRM system that could be helpful for the aftersales services function and how these capabilities could be used to improve the performance of this function in a servitized manufacturing firm. The result of this thesis should present an innovative way for aftersales service function to use various CRM functionalities in routine work that would improve the performance. The following set of questions will be probed to provide structure to this thesis and achieve the desired objective.

1. *What are the business objectives and associated challenges of the aftersales service function?*
2. *What are the different capabilities required to fulfil the business objectives of the aftersales service function?*
3. *How do the capabilities of a CRM system support achieve the business objectives of the aftersales service function?*

The literature review and empirical part of the thesis will cater to answer these questions. Business objectives of aftersales service function will be determined to highlight what governs the performance of this unit. Moreover, the study will also outline the challenges faced by the function that restrict the achievement of these objectives. Capabilities required by the aftersales service function to meet the identified challenges will be deliberated. Furthermore, capabilities offered by CRM systems that could be used in the organizational functions will be discussed. The research is meant to be exploratory which will lead to presenting new viewpoints on a topic through findings (Saunders et al., 2009). The CRM capabilities which enable performance of aftersales service will be reflected.

The thesis would also recommend how CRM capabilities could benefit the aftersales service performance in future.

1.4. Research philosophy and approach

The selection of research methods such as conducting interviews or making questionnaires is not merely a spontaneous decision for the researcher (Saunders et al., 2009). Johnson and Clark (2006) denote that it is important for the business and management researchers to understand their philosophical commitments before they choose a research strategy and employ an appropriate research method. This is because the research philosophy contains important assumptions about the way in which a researcher views the world. It will directly affect the research strategy and eventually the outcome of the research. The research framework for this thesis is adopted from the “research onion” model presented by (Saunders et al., 2009). The model signifies the chosen research philosophy, the research approach, research strategy and appropriate research methods that will be employed. This is shown in figure 1 below.

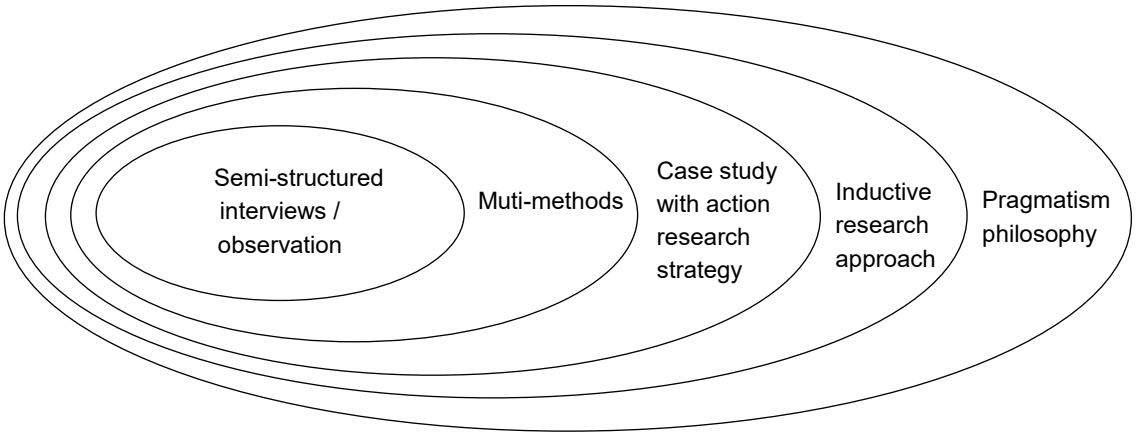

Figure 1. *Research methodology path (Adapted from Saunders et al., 2009)*

According to Creswell (2006), research is conducted based on four dominant philosophies, Positivism, Realism, Interpretivism, and Pragmatism. Each of these signify different aspects of how a researcher could view the problem and what are the focus areas. The chosen research philosophy for this thesis is Pragmatism. Pragmatic researchers chose their point of view that enables adequate answering of the research question. The focus of the researcher is on practical applied research and at the same time integrating different perspectives to interpret the data. The research process and interpretation of results are greatly influenced by values. This philosophy also entails the use of mixed or multiple method research designs for data gathering including quantitative (numerical

data oriented) and qualitative (non-numerical data oriented) techniques (Saunders et al., 2009).

The second step in the adopted model as shown in Figure 1 is to choose an appropriate approach for analysis. This can be either Deductive or Inductive approach. In a deductive approach the study is initiated by building a hypothesis. This hypothesis is then tested by making observations, collecting data and examining the outcome. On the other hand, inductive analysis is initiated by making specific observations which leads to development of generalized conclusions regarding the research question. It means that first the data is collected and then a conclusion or theory is derived from the results in an inductive approach. Analysis of research results will be conducted inductively for this study. It will allow the researcher to relate the data to the context of study and compare findings with the literature (Saunders et al., 2009).

Researchers should also have clear understanding on the purpose of their research which can be exploratory, descriptive and explanatory (Saunders et al., 2009). Exploratory research aims to investigate new phenomena and seek new insights. Descriptive research can be an extension of an exploratory research which is used when the researcher wants to describe a phenomenon prior to data collection. Moreover, explanatory research studies different phenomenon and their relationship more deeply. The purpose of this thesis is exploratory as a new phenomenon and its related context is being studied. There are various research strategies that can be employed based on chosen research approach and purpose. These include survey preparation, case study, action research and more. The research strategy undertaken in this thesis is case study. According to Robson (2002), case study is a strategy employed for doing research where a phenomenon is being empirically investigated in real life context. In this thesis, the relationship between CRM capabilities and business objectives of an organizational function is being investigated in the case company which conforms to the case study definition. It is imperative to note that the research strategies are not mutually exclusive, and one strategy can be adopted as a part of another strategy (Saunders et al., 2009). Therefore, action research will also be employed as a part of this case study strategy because the phenomenon being investigated is part of change implication that has directly affected an organizational function of the case company.

The determination of data collection techniques or research methods is the last step in Saunders et al. (2009)'s framework. These can be divided into mono and multiple methods (Saunders et al., 2009). Mono methods are based on single data collection technique while the multiple methods technique involves more than one technique used together. The distinction of those can be seen in the figure 2 below.

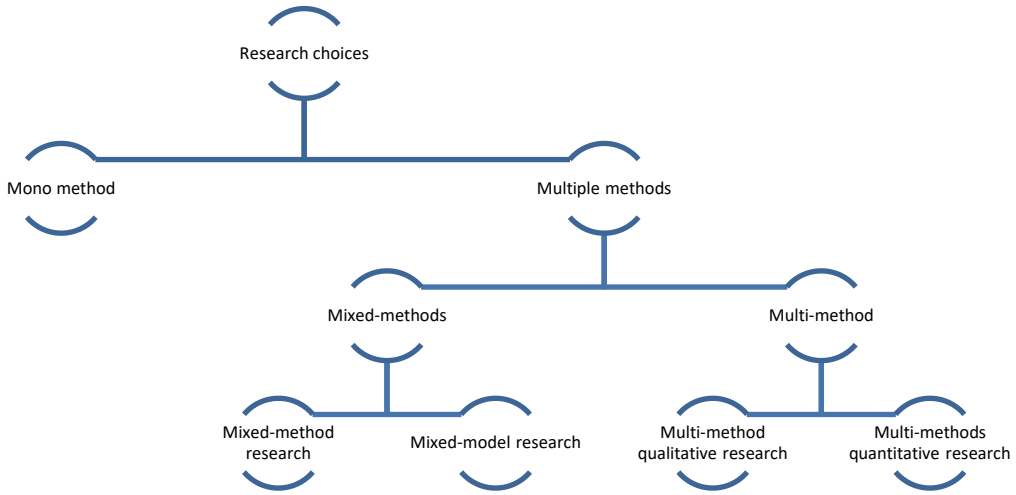

Figure 2. *Research choices (Adapted from Saunders et al., 2009)*

The figure above signifies that there are two research methods under the multiple methods research choice. Multi-method approach can be used on either qualitative or quantitative data, whereas mix-methods allow the use of both qualitative and quantitative methods in parallel or sequence (Saunders et al., 2009). This research will use multi-method approach because it will involve only one type of data collection and analysis which is qualitative technique. It will be performed through semi-structured interviews and observation. Research strategy and data collection techniques are further elaborated in the Chapter 3.

1.5. Research structure

The structure of this thesis has been planned to answer the research questions in a systemic order. Most of the academic research is presented in Chapter 2. This chapter looks at development of conceptual understanding of servitization and its features. Moreover, the concept of aftersales service and its performance measurement are also understood through different theoretical models. This will help to determine the background of services and their business objectives. Also, the challenges of aftersales service and its capability requirements can be highlighted. Further, literature regarding CRM and its offered capabilities in the perspective of services is reflected through existing views and

theoretical frameworks, which will aid in comprehension of this concept and help to link CRM capabilities with performance of aftersales services. In Chapter 3, research strategy and data collection techniques entailing from the research philosophy are introduced and explained in detail. This particularly includes description of methods employed for empirical research and their related guidelines. The empirical findings of the thesis are explained in Chapter 4 based on the themes of research questions. These findings are further analyzed and validated with theoretical concepts in Chapter 5. Moreover, Chapter 5 also describes the implications of research findings in the form of guidelines for the case company to utilize CRM capabilities in enabling aftersales service performance along with limitations of the study and suggestions for possibility of future research. Chapter 6 provides a conclusion for the completed study.

2. THEORETICAL BACKGROUND

This chapter presents the theoretical findings of the study which were obtained through extensive literature review. The relevant concepts related to the research topic were studied through academic resources to develop conceptual understanding. This will also serve as a source to validate empirical findings of the study. The concepts related to servitization, aftersales services, customer relationship management and CRM systems are elaborated in the sub chapters below.

2.1. Servitization

Services have evolved from the concept of servitization. Therefore, it is important to review various aspects related to servitization which will help to understand the background of business objectives and capabilities required for various services. First, the background and definition of servitization are elaborated which provide an overview of the concept. Then the features of servitization are described along with drivers and resource related challenges of servitization which help to establish services capability requirements.

2.1.1 Background of servitization

The Original Equipment Manufacturers (OEM) have traditionally developed and produced physical products for their customers. Most of these manufacturers also provide services closely related to their products which mainly include maintenance and repair. The growth in rivalry and rapidly changing market makes it difficult for these firms to survive the strategic competition with existing product mix and services. The phenomenon of commoditization is prevalent in the market, life cycles are becoming shorter and the profit margins are shrinking (Dachs et al., 2014). According to the strategic marketing theories, these firms can thrive in the competition only if they are able to create customer value (Salem Khalifa, 2004).

Differentiation is an important management strategy which enables firms to present unique offerings in the market that create value to the customer (Lamb et al., 2004). Customized service packages (Albert, 2003) or offerings integrating products and services can enable a firm to differentiate itself in the market and sustain competition, particularly in the manufacturing sectors which have a high installed product base (Wise and

Baumgartner, 1999). Moreover, Gebauer et al. (2005) have signified that provision of service inclusive offerings also enables product manufacturers to earn highest potential margins. In the B2B (business to business) markets, there has been a transition in the differentiating factors valued by customers. According to Ulaga and Eggert (2006), service support, personal interaction and access to knowledge have become core differentiators for customers, superseding product and price of the offering. This leads to the idea of a service-centered offering view presented by Vargo and Lusch (2004). The service-centered offering view requires firms to create offerings by utilizing their core competences and services and most importantly involving customers in the process.

In the present market, customers are not looking for the tangible products offered by different companies, but they value the functionality provided by these products and the solutions that can be achieved by applying them. Undermining this shift in customer perception, it is important for the manufacturers to progressively shift from offering products to customer oriented solutions (Sawhney, 2006). Vander Merwe and Rada (1988) coined the term “Servitization” to describe this phenomenon of service adoption by firms.

2.1.2 Definition and related concepts

The discussions about servitization are usually linked with the terms ‘product’ and ‘service’. In manufacturing, a product is considered as a tangible artefact that is produced to be sold (Goedkoop, 1999). On the other hand, there are various perspectives regarding the term ‘service’. Service as defined Kotler (1997) is an act or performance offered by one entity to another which is essentially intangible and does not result in the ownership of anything. Moreover, it may or may not be tied to a product. In the industry, the term ‘service’ is mostly used when referring to an offering such as maintenance or repair. However, the term ‘service’ is also used to indicate a level of performance such as good or bad. The perspective considering service as a performance level is not considered in this study.

There are several definitions for the concept of servitization put forward by different researchers. Vander Merwe and Rada (1988) define servitization as the provision of complete market packages that constitute of customized combination of goods, services, support, self-service and knowledge in order to enhance customer value. According to Baines et al. (2009), the transition in manufacturing companies to increasingly offer services coupled with their products can be termed as servitization. Brax (2005) argues that servitization is a process in which companies add more and more value to their core

offering through services while experiencing a shift in their core business. Other definitions of this concept also conform to the central idea of delivery of product-based services and focus on an integrated system of both goods and services (Robinson et al., 2002). The distinct models related to this concept exemplify how a change in the balance between product and services in an organization translates to differing levels of servitization. For example, Tukker (2004) puts forwards the concepts of product-oriented services, use oriented services, and result oriented services. Whereas Mathieu (2001) presents a matrix comparing service specificity (customer service, product service, service as a product) and organizational focus.

The term 'Product Service Systems (PSS)' represents another aspect of servitization. This is related to the shift of manufacturing companies from selling products to selling Product Service Systems (Neely, 2008). According to Neely (2008), servitization appears to innovate an organization's capabilities and processes through this shift from products to product-service systems. This change results in transformation of product-centered firms towards PSS (Kowalkowski et al., 2017). In simple terms, manufacturers become service providers. PSS here refers to the output of this process. PSS is an integrated product and service offering that delivers functionalities to customers (Baines et al., 2007). Although, servitization and PSS have emerged from differing perspectives, they are converging towards a common motive which inculcates that manufacturing companies should be focusing on selling integrated solutions or PSS (Tischner and Tukker, 2006).

The literature content regarding servitization highlights the concept of embedding different services in the value proposition. The provision of these services can vary, thus implying different types of servitization (Martinez et al., 2017). Baines (2013) has developed a service typology by which manufacturers can categorize their market offerings and determine level of servitization in their firms. Generally, companies provide services at three broad levels that include base services, intermediate services and advanced services (Baines, 2013). This is shown in the figure 3 on next page.

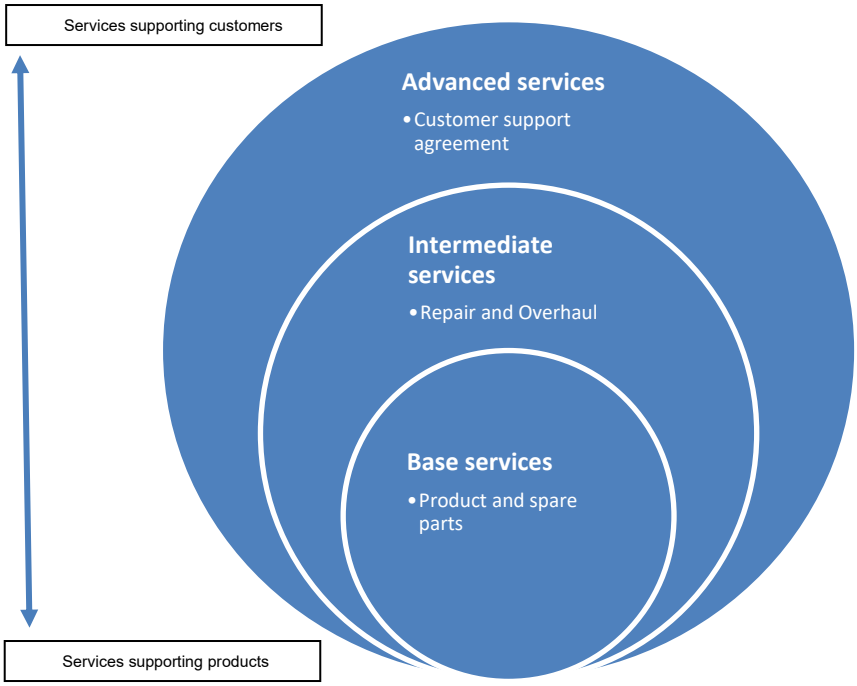

Figure 3. *Types of services offered by OEM (Adapted from Baines, 2013)*

In the figure above, the inner most circle is labelled as 'Base Services' and refers to the primary level of offering from a manufacturing firm. These services are concerned with the provision of the product such as related spare parts. The second level of services is marked 'Intermediate Services'. It includes services such as repair and overhaul, which are targeted to ensure proper product condition and performance. Advanced services are more inclined towards supporting customer. In some of these services, an economic model is associated with product usage where the manufacturer provides the customer with a capability instead of a product. In this case, a contractual agreement is created between service provider and customer. Advanced services are deemed to offer higher levels of customer value than intermediate services as these improve performance, availability and reliability (Baines et al., 2011).

Another framework developed by Cusumano et al. (2015) classifies services according to their role in the value proposition of firm's offering. The authors claim that services have two roles, either these complement the product offering or substitute them completely. According to Cusumano et al. (2015), services can be categorized into three main groups smoothing services, adapting services and substituting services. Smoothing services are meant to promote the product sale or usage without having influence on the functional characteristics of the product. These include services such as maintenance

and financing. Adapting services are associated with the enhancement of product functionalities such as product customization. Substituting services are those in which the customer purchases the product usage instead of the physical product itself. These adhere to the category of PSS concept proposed by Tukker (2004), and advanced services proposed by Baines (2013).

2.1.3 Features of servitization

There has been a drastic change in the way services are produced and marketed by manufacturing companies since the inception of servitization. The provision of services has become a main differentiating factor in offerings of various firms. The value proposition often includes services as fundamental value-added activities (Vandermerwe and Rada, 1988) and the product remains to be a diminished part of the offering (Oliva and Kallenberg, 2003). Neely et al. (2011) has signified this shift towards services by capturing five trends of servitization that are to become evident in global manufacturing firms specially manufacturers of complex engineered products. The trends highlighted by Neely et al. (2011) include the shift from provision of products to provision of solutions, outputs to outcomes, transactions to relationships, suppliers to network partners, and elements to ecosystems. This is shown in figure 4 below.

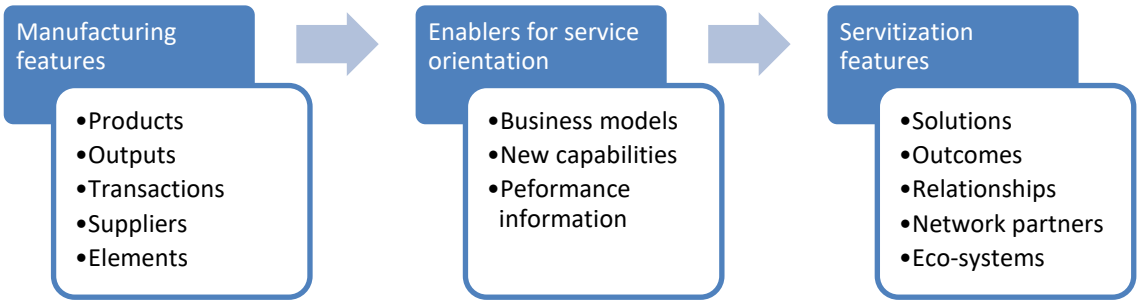

Figure 4. *Describing the shift to services trend (Adapted from Neely et al., 2011)*

The figure above signifies five major features of the manufacturer's shift towards services trend. As manufacturers servitize, they are expected to provide more turn key solutions to fulfill their customer needs instead of typical products. With this shift, the complex equipment manufacturers are likely to offer functionality or availability-based contracts more often to their customers which guarantee the product uptime. This entails that manufacturers shall often engage in a long-term relationship with their customers instead of having infrequent transactions. The inclusion of complex services in the manufacturer's value proposition shall also involve multiple providers to co-operate and transform into partnership networks instead of work being done among limited suppliers. The evolution

of partnership networks is expected to transform separate industrial elements into larger industrial ecosystems. This transformation will influence the way that partners work together and their respective roles and responsibilities. These trends are not meant to completely replace traditional practices, but these are likely to prevalent as manufacturing firms adopt servitization. Moreover, the enablers for service-oriented focus in the figure above reveal that new capabilities are needed by organizations to shift to service oriented focus. The trends explained in this paragraph highlight that a key feature of servitization is customer centricity. According to Oliva and Kallenberg (2003) the customer orientation is based on two elements of shift. The first element involves shift of the service offering from product-oriented services to process oriented services. This means that the focus of service moves from ensuring functioning of the product to pursuing efficiency in end-user's processes related to the product. The second element involves a shift of the nature of customer interaction. The firm shifts from traditional selling or a transaction-based relationship to maintaining a long relationship with the customer. This element of customer centricity signifies that firms need to develop customer related capabilities for service-oriented focus.

There are a variety of forms of servitization with the features differing for each. Various authors including Oliva and Kallenberg (2003) and Gebauer et al. (2005) have identified that servitization has potential applications along the so-called "product-service continuum". This continuum ranges from firms that offer traditional services as add-on to their products to service providers who have services as the principal of their value creation process. These companies are required to evaluate opportunities and challenges at different levels of services incorporation in their offerings and then define their strategic position (Gebauer et al., 2008). This is envisioned to be a dynamic process, with companies redefining their position over time and moving towards increasing service dominance.

2.1.4 Drivers of servitization

Manufacturing companies have different rationales to adopt servitization. According to various scholars these comprise of three main sets of organizational objectives which include financial, marketing and strategic objectives (Mathieu 2001; Oliva and Kallenberg, 2003). The primary target of any business is to achieve their financial objectives. Servitization enables the manufacturing firms to establish profitable business fields that provide higher revenues and margins. In many industries, after-sale services contribute highest margins in the product portfolio (Cohen et al., 2006). On the marketing front,

manufacturing companies can improve company image, customer satisfaction and retention by adopting servitization (Gaiardelli et al., 2007). The strategic objective of the firm, which is perceived as long-term competitive advantage can also be achieved by incorporating service inclusive offerings that are difficult to replicate for competitors (Gebauer et al., 2011). Combining the work of Baines et al. (2009) and other authors, Dachs et al. (2014) has presented a model that identifies the hierarchy of servitization rationales based on three main sets of objectives defined above. According to Dachs et al. (2014), there are three distinct organizational motivations in servitization strategies which include growth, profit and innovation. Moreover, these primary rationales have been used to derive second, third and fourth level organizational servitization rationales. This is shown in figure 5 below.

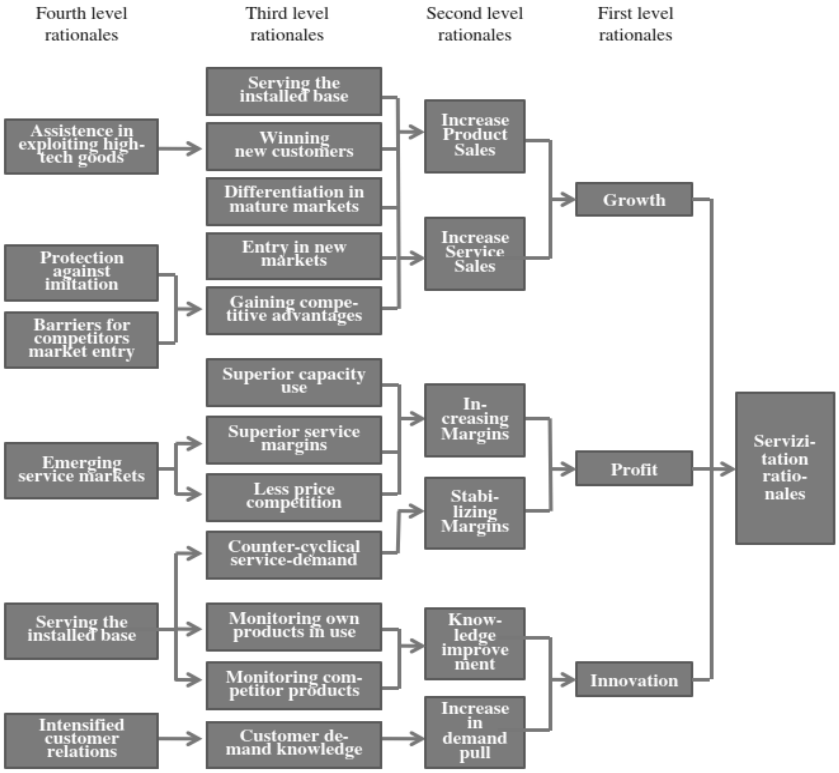

Figure 5. *Servitization rationales (Adapted from Dachs at al., 2014)*

The figure above shows that one of the significant motives behind a firm's servitization is growth which is described as a strategic objective (Gebauer et al. 2005). An organization can stimulate its growth by increasing its product and service sales. This surge can be achieved by using service elements to differentiate its manufacturing offerings in the mature market and gaining competitive advantage (Vandermerwe and Rada 1988; Oliva and Kallenberg 2003). Moreover, sustainable competitive advantage requires the firm to set barriers for entry of competitors, protect against imitation and assist the diffusion of

innovative products. Oliva and Kallenberg (2003) claim that competitive advantages achieved through services are often sustainable since services are more difficult to imitate.

The profit rationale behind servitization is derived from the financial objectives of an organization (Baines et al. 2009). Biemans et al. (1997) highlights that incorporating services in the offering can help a firm to enhance its profit by increasing margins or by achieving profit stabilization. A service inclusive offering will help to enhance capacity utilization, create profitable service markets and evade price competition in mature markets thus resulting in higher margins. Product-service combinations are less sensitive to price-based competition (Malleret, 2006), and in turn provide higher profitability (Biemans et al., 1997). On the other hand, services can also help stabilize profits. At times when product sales are decreasing, service inclusive offerings can be used to serve the installed base (Wise and Baumgartner, 1999) to smooth capacity utilization as customers' demand for products and services tend to be counter cyclical.

The innovation rationale has originated from the marketing objectives of a firm. Innovation can be achieved by improving market knowledge and increasing demand pull. Biemans et al. (1997) claims that the enrichment in service offerings helps to fortify relationship with the customer and in turn enables the organization to gain insight about customer demand. According to Brax and Jonsson (2009), product-related services serve as an information feedback for the product development activity. Moreover, services also help to establish more contact opportunities with the customer, enabling repeat sales and monitoring market performance (Mathieu, 2001). The servitization rationales explained above provide an understanding about the origin of business objectives of various services including aftersales service. The second level rationale is important to determine business objectives for a service function and the third and fourth level help to identify the capabilities required for achievement of these business objectives.

2.1.5 Resource related challenges in servitization

The trend of servitization has influenced many manufacturing companies to acquire services-based business models that provide strategic, economic, and marketing advantages (Gebauer et al., 2005). According to Wise and Baumgartner (1999), this transition requires the manufacturers to capture more business opportunities in the customer's value chain. These opportunities can take the form of services that supplement use of a product or replace the product altogether for end users. This provision allows

the firms to pursue greater profits and create differentiation in the market. On the other hand, Oliva and Kallenberg (2003) signify that successful servitization of a manufacturer requires establishment of novel principles, structures and processes in the firm operations which are different from those associated with traditional manufacturing. Various authors have suggested that there is a distinct mix of organizational structures and processes which are appropriate for a servitized manufacturer depending on their characteristics.

In general, realignment of the business model, organizational structure and processes, and resources are vital to support the new service-oriented focus of a firm (Parida et al., 2014). Resource realignment is a critical activity to be undertaken at this stage which enables value creation. Sirmon et al. (2007) defines resource realignment as a process of obtaining and bundling firm's resources to build capabilities and leveraging those capabilities to create value for customer and the owner. When shifting from a product to a services focus, realignment of resources might include developing new customer related capabilities and shedding production-related resources. The accomplishment of resource realignment is highly dependent on the development of dynamic capabilities and competencies within the firm. These capabilities also support the firm to adapt to changing market conditions by re-organizing its structure and resource portfolio (Teece et al., 1997). Spring and Araujo (2013) have identified that the transition towards servitization requires manufacturers to create new capabilities and balance their existing capabilities. This would require resource realignment in various organizational functions. During this process the firm might focus on creating new resources, leveraging existing resources, or releasing resources which are not required.

The creation of new resources is one way to accomplish resource realignment. It requires higher-order dynamic capabilities such as learning capability to acquire and integrate new knowledge and the development of new skills, processes, and attitudes. Levinthal and March (1993) highlight that firms must develop learning and integrative capabilities to identify new knowledge and incorporate new resources in the organization. The development of new resources can take place in numerous forms within different functions of the organization simultaneously. According to Oliva and Kallenberg (2003), creating a separate service business unit to support the development of service offerings is an example of new resource. Moreover, development of technologies to acquire customer process data for support of offerings is also an example of new resource creation (Porter and Heppelmann, 2014).

Along with the addition of new resources, firms undergoing servitization should also focus to reconfigure their existing resources according to the new service-oriented context (Danneels, 2011). These existing resources are beneficial for manufacturers to launch their servitization journey. Most firms begin the servitization process by offering complex product related services to customers based on their existing resources and then move towards broadening the scope of their service portfoilo (Oliva and Kallenberg, 2003). Consequently, this leads to the provision of total solutions. The service focused model requires a different set of resources compared to the traditional product-dominant model of manufacturing firms in terms of physical assets and organizational structure. It is therefore necessary for firms pursuing servitization to give away their product-centered resources and acquire services-focused resources instead. Sirmon and Hitt (2003) elaborate that giving away of resources implies that firms should shed the resources that are no longer needed and abandon their established principals and structure that does not fit with the new model. The literature above signifies that firms need to acquire resources to enable service-related capabilities that help to support servitization and achieve the desired objectives. As the servitization strategy is customer centric, such resources should be adopted which can provide capabilities related to customer orientation.

2.2. Aftersales service

The manufacturing companies can incorporate services in their offerings through different strategies. Aftersales service is one such strategy evolved from servitization. This sub chapter provides an overview of different service strategies including after sales service. Moreover, the objectives and features related to aftersales services are also discussed. Furthermore, the concepts associated with knowledge management and performance measurement of aftersales services are also described. This chapter helps to understand the concept of aftersales service and identify its business objectives and required capabilities to fulfil those objectives.

2.2.1. Service strategies in manufacturing companies

Manufacturing companies are progressively turning towards extension of their service business as customer needs become complex and market competition increases (Anderson et al., 1997). The integration of services with traditional products offers higher margins and new growth opportunities for these organizations as highlighted in Chapter 2. Service infusion within the offering requires these firms to employ certain strategy and change their position on the product-service continuum (Oliva and Kallenberg, 2003).

Service strategies represent different positions on this continuum as shown in figure 6 below.

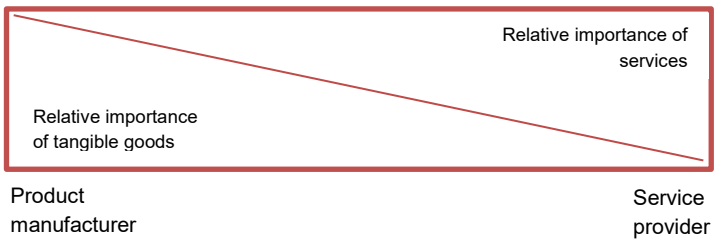

Figure 6. *Product-service continuum (Adapted from Oliva and Kallenberg, 2003)*

The figure above shows the product-service continuum model presented by Olivia and Kallenberg (2003). According to Kotler (1997), this model signifies a spectrum of offerings based on different levels of product service integration. The model begins with an offering based on pure goods where the organization is a product manufacturer. The extent of services infusion increases as the model progresses from left to right. Services are integrated as an add-on to the products and then gradually services dominate the offerings. On the extreme right, service constitutes main part of the value proposition and the company can be termed as a service provider.

Based on the product service continuum, Gebauer et al. (2008) identifies different patterns of service strategies that can be adopted by manufacturing companies for development of service business. These four strategies are denoted as After-Sales Service Provider (ASP), Customer Support Provider (CSP), Outsourcing Partner (OP), and Development Partner (DP) (Gebauer et al. 2008). The differentiating factors within these strategies include type of service offering, offered value proposition and pricing (Fischer et al., 2010). The following section elaborates these four different strategies.

After-Sales Service Provider (ASP) strategy focuses on keeping up functional capability of the product during its use by the customer. This strategy is employed in a price sensitive and highly competitive market. The salient features of value proposition include competitive pricing and product performance assurance through after-sales services. Various after-sales service activities are bundled under this strategy including repair, inspection, and spare-parts management. The formulation and implementation of after-sales services is a collaborative effort among various business units. ASPs also feature a front-line team which responds to customers in case of a product breakdown and assists them when delivering standardized after-sales services such as spare parts, repair, inspection, hotline, and basic training.

Customer Support Providers strategy is targeted to optimize customer operating processes. This implies that CSPs help their customers to achieve maximum uptime and output through provision of services. The services provided by CSPs include comprehensive preventive maintenance, advanced training, and process optimization. This strategy is successful in markets where customers value product performance and reliability. CSP are different than ASP in a way that they are not meant to react to product failures, but rather prevent them. The value proposition offered by CSPs constitutes of high product reliability and increased customer efficiency. Tailored service offerings are also part of CSP strategy that satisfy the unique needs of an individual customer. Moreover, the frontline employees deliver highly customized services and serve as performance enablers. The implementation of this strategy requires setting up a new service division with specific responsibilities for different service offerings. Collaboration with customers is a key factor for the success of this service strategy.

The aim of Development Partners' strategy is to create innovative solutions for customer processes. These solutions are expected to be unique and specific to customer needs, providing them a sustainable competitive advantage. The solution-based offerings constitute of product and services bundled together. DPs' value proposition is based on provision of design and development services to support customers in the process development for improved performance. The research and development team of DP is the main service provider in this case which co-produces solutions with customers. The firm's customers benefit directly from their development competencies. On the other hand, employees collaborate with customers and participate in the implementation of innovation. The collaboration with customers is considered vital in contributing to a successful implementation of this service strategy.

The goal of outsourcing partners is to manage the customer's operating processes and undertake their operating risk. This strategy is ideally implemented in situations where the customer requires the product performance instead of the physical product itself to reduce the capital employed. The value proposition of OPs is based on reducing the customer's capital employed and managing the risks associated with it. Outsourcing Partners usually offer operational services to the customer which are standardized and focus on process efficiency and economies of scale. They can also provide customized services such as troubleshooting, repairs, and spare parts at increased service costs. In OPs, the front-line staff is considered as principal service provider that delivers the output of the operating process to the customer and collaborates with them. OPs typically set up a separate service company as a new service organization. This study is related to a

manufacturing company which is pursuing servitization through aftersales service strategy. Therefore, the concept of aftersales services will be discussed in detail in the next section. Moreover, the review of this relevant literature will help to identify what are the business objectives of the aftersales services and what capabilities are required for the enablement of their performance.

2.2.2. Aftersales service objectives, features and activities

Aftersales services (ASS) are defined as a set of activities taking place after the purchase of a product (Patelli et al., 2004). These services are provided to the customer as an add-on to the traditional sale of goods, to ensure functionality and durability throughout use (Legnani and Cavalieri, 2012). ASS is also referred as the first step of servitization. There are certain business objectives behind the provision of these services which have been outlined by (Patelli et al., 2004). These include:

- Assurance of product availability and restoration of product functionality after failure
- Resolution of customer issues related to product use
- Provision of support to customers in the processes related to product use
- Extension of support to the customer at product disposal
- Attainment of competitive advantage and enhanced customer satisfaction

Firstly, the primary aim of offering aftersales services is to ensure that the product remains available to the customer for use and its functionality is restored in case of breakdowns. Secondly, these services are targeted to resolve problems faced by the customer regarding product use. Moreover, aftersales services are also intended to provide support to customers in their processes and at the end of product life. Ultimately, provision of ASS is expected to provide competitive advantage to the firm and augment the level of satisfaction customers have regarding the firm's offering.

According to Gaiardelli et al. (2007), aftersales service encompasses activities which are dedicated to support customers in the usage and disposal of the product. Potluri and Hawariat (2010) elaborate that ASS entails some or all operative activities of distribution chain that occur during the product use. Due to the activity-based nature of ASS, it can be offered in various formats such as technical advice, maintenance and spare parts delivery (Ahn and Sohn, 2009). Hence, ASS is also referred to as customer support, product support or technical support (Kurata and Nam, 2010). For many manufacturing

companies these services contribute to the accomplishment of financial goals and improved customer satisfaction (Ahn and Sohn, 2009). Patelli et al. (2004) has pointed out certain characteristics related to provision of aftersales services. These characteristics include:

- Aftersales services represent a business
- Aftersales is a service
- Aftersales is a process
- Aftersales is an organizational unit
- Aftersales services are supplied through a service network

Firstly, in most manufacturing companies, aftersales service is considered as a separate business division. This division is expected to produce adequate financial results and competitive performance similarly as in case of product sales. Secondly, aftersales service is a type of product-service system and should be considered according to a typical service. Some features of this service include front and back-office activities, proximity to the customer and focus on quality and timeliness (Brignall et al., 1991). Thirdly, Aftersales services can also be viewed as a process comprising of various activities provided by different functions and organizations. The objective of this process is to maintain product quality and reliability and increase customer satisfaction (Ehinlanwo and Zairi, 1996). Fourthly, Aftersales service represents an organizational unit which is deemed as a cost center. The unit has budgeted goals and performance measures are needed to analyse the business results and support decision making. Finally, provision of aftersales services involves numerous independent organizations other than the service provider which forms a service network. Customer is also an important stakeholder of this network. A collaborative mechanism is required in the network to satisfy relative goals of all parties (Seuring and Goldbach, 2002).

Aftersales services incorporate a wide range of activities that are required during different stages of product lifecycle. Goffin and New (2001) have classified these under four categories which include services associated with product sale, services associated with product use, services associated with recovery of product functions and services associated with product disposal. The first category of services is offered at the time of transferring product ownership to the customer (Goffin, 1999). These services are dedicated to make the product functional and include activities such as installation, training, product documentation, and insurance services. The services offered under second category are

linked with the use of product to ensure sustainable product efficiency in customer's processes (Goffin and New, 2001). These usually take the form of customer care and product check-up. Activities related to restoration of product functionality are classified under the third category of services (Goffin, 1999). Mainly technical activities such as maintenance, repair of products and replacement of defective parts are included. The last category of services is linked to sustainable disposal of the products at the end of their useful life span. Moreover, there can be several functions under after-sales services such as customer support, product support, technical support and service (Baines et al., 2007). Goffin & New (2001) have signified seven key elements of customer support offered during different stages of the product cycle. These elements are mentioned below.

1. Installation: This element of service is provided after the product sale in order to make the product functional for the customer.
2. User training: Training is a useful service element to educate potential users about product use and related activities.
3. Documentation: This support element enables the customer to understand different aspects of the product by themselves such as operation, installation, maintenance and repair without requiring help from the firm.
4. Maintenance and repair: These are required to ensure that product remains functional throughout customer' use. This could include cleaning of equipment or replacement of damaged parts.
5. On-line support: This element involves interaction of customers with the product experts to help them use products more efficiently or provide solutions to their problems.
6. Warranty: Manufacturers provide support in the form of warranties to reduce the financial risk of customers owning products for certain period.
7. Upgrades: This support element is offered to the customers as an option to enhance the performance of existing products such as special kits.

Aftersales services are usually offered by manufacturing companies in response to a customer problem such as product failure restoration (Goffin and New, 2001). According to Johansson (2006), these services are a combination of goods and services. These include tangibles such as spare parts as well as intangibles related with customer service (Johansson, 2006). The amalgamation of these two important aspects, spare parts and customer service, results in the delivery of aftersales service.

2.2.3. Functional areas of aftersales service

The Institute for Advanced Industrial Management classifies the Aftersales service into three functional service areas which include customer service, spare parts service, and accessories business (Dombrowski and Fochler, 2017). Moreover, Gaiardelli et al. (2007) has identified three major activities critical for the success of after-sales service, these include field technical assistance, spare parts management and customer service. According to the scope of this study, concepts related to customer service and spare parts function are discussed below. These major activities determine the capabilities required to fulfil the delivery of aftersales service and help achieve its objectives.

Customer service

Lovelock (1991) highlights that customer service is an activity which involves interaction of a firm's representative with the customer. This element is usually added to the sales phase within the customer activity chain to augment the product offering through supplementary services (Wouters, 2004). Customer service provides technical and commercial information and services to the customer. These often include warranty and complaint management (Gaiardelli et al., 2007). The motive behind designing and performing this service is to achieve operational efficiency and customer satisfaction. Manufacturing companies have different types of customer service and sometimes it is distributed on different levels. The function of customer service has transformed from undertaking simple tasks such as providing information and handling orders to conducting complex tasks such as providing financial consultation or managing the relationship with key accounts (Kantsperger and Kunz, 2005). Customer service has a front-end operative role in aftersales services. There are many activities under customer service which are provided directly to the customer, these include financial services, training, instruction, technical documentation, installation, assembly and maintenance, repair and overhaul. Customer service serves as a competitive advantage for manufacturing companies which face the challenge of commoditization.

Spare parts management

Spare parts function within aftersales service is responsible for inventory management, customer order management and delivery of spare parts (Gaiardelli et al., 2007). This function ensures that the firm can meet the demand of various customers with different requirements of spare parts. The level of distribution and pricing of spare parts are the most complex problems for any firm's management in this function. The main purpose

with spare parts function is to ensure the right availability of spare parts at the right time to fulfill customer needs incurring lowest possible costs to the firm. Moreover, the ultimate purpose is to reach maximum level of customer satisfaction which can be accomplished by stable and steady spare parts distribution. The existence of this function also ensures that spare parts are provided to customers for timely repairs (Hopp et al., 1999) and customers are protected against extended down-time (Kennedy et al., 2002). Value creation of aftersales service providers is based on offering correct spare parts and ensuring proper product functioning.

Changing role in servitization

Servitization has a significant influence on changes in the business and product structure of manufacturing companies (Baines, 2013). This has also affected the way in which aftersales service is delivered and how the functions of customer service and spare parts are aligned. The spare parts function has changed into a back-end process in the aftersales service while customer service has become the front-end process facing customer. According to Dombrowski and Fochler (2017), the direct relationship between customers and spare parts function has turned into an internal customer-supplier relationship between Customer Service and Spare Parts function. Internal interfaces between customer service and parts service are essential for optimum customer service. Process disturbances have a direct influence on the revenues of the offered services (Stremersch et al., 2001). The main goal of the process is set in such a way that required spare parts are made available in an efficient manner, at a suitable price and lead time. Moreover, a resilient flow of information from the front-end to the back-end of the service is required to fulfill customer needs efficiently. It is also important that necessary information is conveyed from back-end to the customer to enhance customer satisfaction. The increasing competition and pressure to optimize due to changes in servitization enjoins industrial companies to incorporate a shorter lead-time for spare parts quotation and order fulfilment, meet customer requirements by providing functional and quality products and offer competitive prices (Hvam et al., 2006).

2.2.4. Role of knowledge management in aftersales service

Knowledge management is defined as a capability of an organization to integrate people, technologies, processes and strategy within the firm for the purpose of knowledge creation, sharing and utilization (Martelo-Landroguez et al., 2013). According to the resource-based view, knowledge is an organizational resource that can contribute to gain compet-

itive advantage (Barney, 1991). Therefore, an organization utilizes its knowledge management capability (KMC) to align knowledge resources with the needs of the market (Chen and Fong, 2015). KMC comprises of different processes that a firm requires in order to develop and use its knowledge including knowledge acquisition, conversion, application, and protection (Gold et al., 2001). These processes reflect accumulation, assimilation and exploitation of critical knowledge within an organization. KMC is supported by data base technologies and activities in various organizations to create and share knowledge.

Aftersales services are provided by firms with the objective of attaining competitive advantage and enhanced customer satisfaction. Moreover, another business motive behind these services is to resolve customer issues related to product use (Patelli at al. (2004). The customer centric nature of these services requires the firms to understand the needs of their customer in order to provide efficient service (S.-M. Tseng, 2016). These firms should acquire customer knowledge by interacting with the customer in order to enhance the service offering. Gibbert et al. (2002) signifies that possession of customer knowledge allows the firms to develop customized solution for the customer. According to Bull (2010), firms need to improve their knowledge processing capabilities in order to obtain the knowledge needed to offer subsequent services that can satisfy customers. The ability to develop Aftersales services is based on organizational knowledge. Firms incorporate knowledge management systems and enhance the knowledge management capability of their human resource for performance improvement (Criscuolo et al., 2007). It is implied that knowledge management plays an important role in the delivery of aftersales service which directly affects customer satisfaction and firm's competitive advantage. KMC has become a core competence source for aftersales service providers to survive competition.

2.2.5. Performance measurement in aftersales service

The provision of after-sales services such as installation packages, technical advice, maintenance and repair is gaining importance in the manufacturing sector. OEM companies are moving away from the manufacturing-based model of the exchange of value embedded in units of output (Vargo and Lusch, 2004) towards a service provider model. The motive behind offering services with core product is based on three main reasons (Oliva and Kallenberg, 2003). These include high profitability and margins in after-sales, transformation in customer requirements and attainment of competitive advantage through differentiation. This signifies the importance of aftersales service for the firm to

sustain competition and achieve its objectives. Therefore, after-sales service should not only be considered as a set of operational activities but also as an integrated strategic process (Gaiardelli et al., 2007). Moreover, firms need to measure the performance of aftersales services as these have an integrated relationship with organizational performance.

The previous section 2.2.2 highlighted features of aftersales services denoted by Patelli et al. (2004). According to Patelli et al. (2004), Aftersales service can be considered as a business, a process, a service and an organizational unit at the same time within the context of a company. Gaiardelli et al. (2007) elaborates that the drivers of aftersales service efficiency and effectiveness at each of these levels should be taken into consideration when measuring performance of these services. These drivers can be termed as the specific Key Performance Indicators (KPIs) for aftersales services. KPIs should be related to the company's overall strategic goals, in order to establish the consistency between strategic and operational objectives (Gaiardelli et al., 2007). Moreover, different performance indicators need to be considered including both financial results (revenue, cost or profit) and operational drivers of performance, such as quality and responsiveness.

Gaiardelli et al. (2005) has proposed an integrated framework for the measurement of after-sales performance which links the operational objectives with strategic objectives. This framework is based on existing performance measurement models in the literature, which have been applied in the context of after-sales activities (Gaiardelli et al., 2007). The framework is built on four levels and each level signifies an interpretation of aftersales service within a firm. The first three levels are divided into business level, process level and activity level. The performance measures within these levels are focused on short term perspective. Development and innovation represent the fourth level which considers a long-term perspective for performance measurement. This is shown in the figure on the next page.

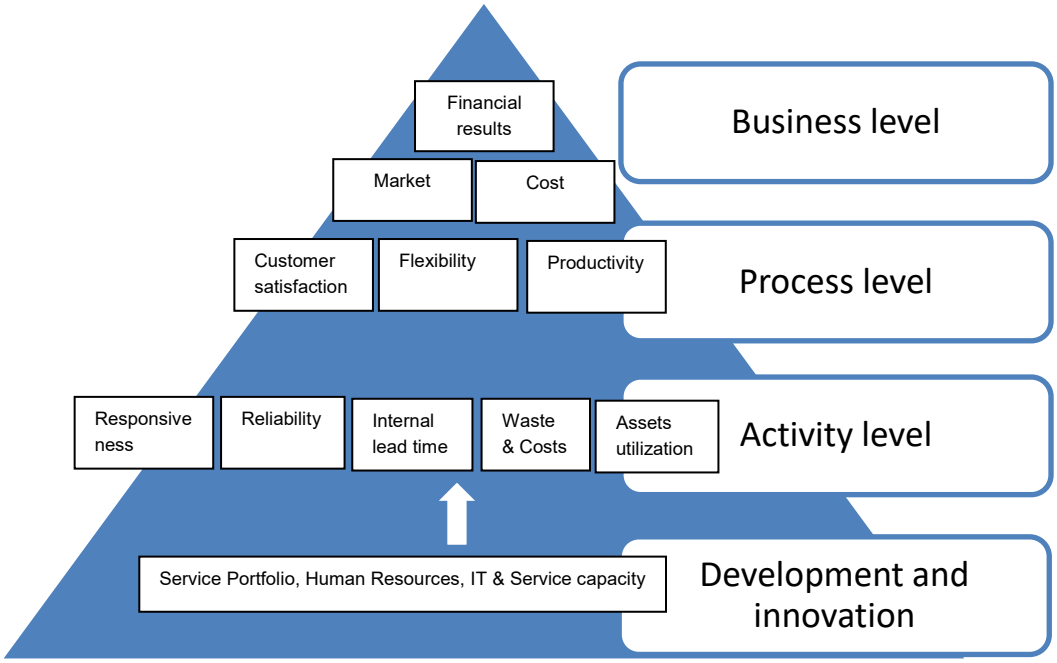

Figure 7. *Aftersales service performance measurement framework (Adapted from Gaiardelli et al., 2005)*

The figure above shows that business level is the top most tier of the aftersales performance measurement framework. This is a strategic level where overall after-sales financial performance is considered. The financial performance is dependent on market results that regulate revenue and consumption of resources that affect costs. Financial indicators such as operating profit and return on assets are used at this level to measure performance. The next tier under the business level is process level. Process establishes a link between the business's strategic objectives and specific activities carried out. The performance of an aftersales service process can be measured based on customer satisfaction, flexibility and productivity (Lynch and Cross, 1991). The delivery of superior customer value to the customer and resulting customer satisfaction are drivers of financial performance (Zeithaml et al., 2009). The customer satisfaction measurement identifies the gap between customer expectations and performance of the firm regarding a service provided. The flexibility measures the ability of a firm to satisfy the customer expectations (Lynch and Cross, 1991) based on customization of output and process lead time. The productivity measurement is related to efficiency in resource consumption.

The third level of the framework considers the performance of after-sales service as an organizational unit based on activities. This level has been divided into two sets of activities including front office and back office (Gaiardelli et al., 2007). Front office activities impact directly on customer satisfaction and the back-office activities are responsible for

process efficiency and lead time. The model highlights five performance dimensions at the activity level which include reliability, responsiveness, internal lead times, waste and costs and assets utilization. Reliability represents ability of an organization to perform the promised service. Responsiveness is the measure of how swiftly aftersales service is provided to the customer. The working pace of back office activities is represented by internal lead times. Waste and costs refer to internal efficiency in the consumption of resources and asset utilization signifies how effectively the assets are utilized to support demand satisfaction. Different indicators can be associated with each performance attribute. The last level of this framework represents the dimension of development and innovation (Kaplan and Norton, 1992). This entails a long-term perspective and aims to measure the drivers of future organizational results enabled by investments in new products and services, investments in intangibles and investments in infrastructures.

The framework proposed by Gaiardelli et al. (2005) enables the firms to relate their strategic performance with their operational performance. Moreover, it also provides a means to evaluate how operational drivers are entangled with financial and competitive results through a cause-and-effect relationship. This helps to identify the business objectives of aftersales service. The strategic performance evaluation is vital for the managers whereas, monitoring operational level efficiency and effectiveness helps the employees in charge of specific activities to review their performance. Thus, it is evident that organizations need to measure after-sales performance at different levels using different performance dimensions. This would allow them to review their performance proficiently and take necessary actions for improvement.

2.3. Customer relationship management

The previous sub chapters identified that service provision is a customer centric process as signified by Baines et al. (2009). Moreover, the firms providing services need to acquire resources and capabilities to meet their business objectives and tackle the process related challenges. One such capability is customer relationship. This sub chapter discusses the resource related challenges in servitization and customer relationship management in general.

2.3.1. Servitization and resource-based view of a firm

The trend of servitization has influenced many manufacturing companies to acquire services-based business models that provide strategic, economic, and marketing ad-

vantages (Gebauer et al., 2005). According to Wise and Baumgartner (1999), this transition requires the manufacturers to capture more business opportunities in the customer's value chain. Parida et al. 2014 emphasizes that realignment of organizational structure and processes, and resources is vital to support the new service-oriented focus of a firm. Sirmon et al. 2007 defines resource realignment as a process of obtaining and bundling firm's resources to build capabilities and leveraging those capabilities to create value for customer and the owner. Moreover, according to the capability view, servitizing firms need to acquire and integrate resources that increase their responsiveness to the changing needs of individual customers (Peppers et al., 1999).

The adoption of servitization has led many firms to focus on resource-based view (RBV) for realignment of their resources. Resource Based View (RBV) analyzes and interprets resources of the organizations as a gateway to achieve sustainable competitive advantage. RBV constitutes that an organization can be considered as a collection of financial resources, technical resources and human resources (Barney, 1991). These resources have vital contribution in the firm's capacity to innovate. According to Barney (1991), the main source of competitive advantage is provided by resources that are valuable, rare, inimitable and non-substitutable. This highlights the framework of resource-based view as shown in figure 9 below.

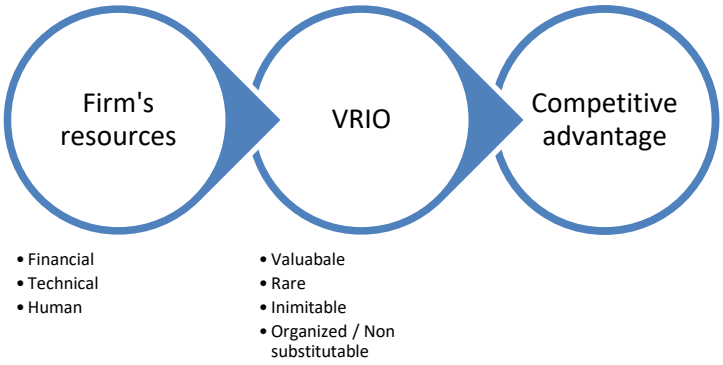

Figure 8. *Resource based view (Adapted from Barney, 1991)*

The figure above on the previous page shows the proposition outlined through resource-based view. Firms possess different kind of resources which can be tangible such as financial resources or intangible such as human resources. The resources which have VRIO (Variable, Rare, Inimitable, Organized) attributes are the main contributors to provide competitive advantage. Capabilities are intangible abilities of a firm to organize, use and transform these available resources into value creating products or services (Amit and Schoemaker, 1993).

The transformation towards servitization requires resource realignment in various organizational functions. During this process the firm might focus on creating new resources, leveraging existing resources, or releasing resources which are not required according to the resource-based view. When shifting from a product to a services focus, realignment of resources might also include developing new customer related capabilities and shedding production-related resources. One of the key capabilities required for service focus is Customer Relationship Management.

2.3.2. Definition of CRM

Customer Relationship Management or CRM is defined as an organizational strategy which focuses on the development of appropriate relationships with key customer base in order to create added shareholder value for the organization (Payne and Frow, 2005). CRM as a strategy inculcates the use of organizational resources such as information technology and relationship marketing capabilities to create profitable long-term relationships with customers. This strategy enables the firm to understand customers better and create value through mutual collaboration. The implementation of CRM strategy requires cross-functional integration of processes, resources and capabilities which is accomplished by utilizing information, technology, and applications. Therefore, this strategy is most often associated with the implementation of a CRM system (Mithas et al., 2005). According to Kotler and Keller (2012), CRM is a marketing approach which provides satisfaction of customer needs at every point of interaction between the customer and the organization. Moreover, it reinvents the organization around the customer, making it customer-centric. CRM strategy is vital for businesses with service-oriented approach, to adapt their business activities to reach towards their customers.

The concept of CRM can have other different perspectives including CRM as a philosophy, as a process, as an information technology application, and as an organizational capability (Zablah et al., 2004). The perspective of CRM as a philosophy focuses primarily on customer loyalty and it enjoins the organizations to reshape their cultures and process with concentration around customers (Elkordy, 2014). CRM as a process includes a collection of activities that help an organization to attract and retain customers through increased satisfaction and loyalty (Gibbert et al., 2002). According to Khodakarami and Chan (2013), the main CRM processes comprise of acquiring customers, developing understanding about them, providing services and anticipating their needs.

CRM as an organizational capability enables a firm to manage long term profitable relationships with its customers and to enhance its competitive position (Elkordy, 2014). This

view entails that firms need to acquire and integrate resources that enable them to respond to the needs of individual customers and contribute to the creation of a competitive advantage. According to Elkordy (2014), CRM capability is based on the integration of four resources which include CRM technology, CRM processes, customer orientation, and CRM organization. The technological perspective of CRM considers it as an information technology solution that supports the development of profitable customer relationships (Torggler, 2012). These systems enable organizations to establish contact with the customers, provide them services, record and store their information and analyze that information to add value to the business (Khodakarami and Chan, 2013). There are certain technologies related to CRM such as sales force automation and data mining which have been implemented in various industries. Khodakarami and Chan (2013) highlight that according to most researchers, technology plays a vital role in enabling CRM, but this perspective cannot be considered alone to conceptualize CRM.

2.3.3. CRM benefits and effect on firm performance

Customer relationship management (CRM) is recently being adopted as a principal strategy in the firms (Lindgreen et al., 2006). The role of CRM in the development of relationships with customers is being considered in a broader perspective which influences firm performance. There are several studies which have explored the relationship between the benefits of CRM and firm performance (Chang, 2007). CRM plays a key role in the growth of an organization and helps to increase the satisfaction of its customers. The vendors that sell CRM technology have identified numerous benefits that are provided by CRM such as improving profitability, customer satisfaction, sales productivity, and sales predictability (Taber, 2013).

Baran and Galka (2013) highlight that the most apprehended benefit of CRM for firms is the ability to retain and satisfy the right kind of customers, which in turn increases sales and eventually profitability. CRM provides a competitive advantage for the firm as it allows the firm to focus on improving relationship with existing customers and simultaneously attaining new profitable customers. Moreover, with CRM the firm has an opportunity to upsell additional products in a solution, cross sell other products to customers and hence reduce service and operational cost with the help of CRM (Peppers and Rogers, 2004). Rapp et al. (2010) further elaborate that the benefits of CRM and superior customer value include shorter sales cycles, lower service costs, rapid acceptance of offerings, higher market share and better return on investment. The implementation of CRM in an organization ensures effective coordination and integration between different

functional units. CRM connects the technological assets, organizational processes, and functions together which helps to collect and share customer knowledge. Mithas et al. (2005) find that customer knowledge increases following CRM system implementation. This knowledge can be used to understand customer needs and work towards enhancing customer satisfaction (Kohodakarami and Chan, 2013).

The organizations manage their customer relationships through the CRM platform (Mithas et al., 2005). This platform helps to define an approach in determining the key customers and provides knowledge about their life time value. Moreover, it allows sharing of all related knowledge within departments and allocating resources to satisfy key customer needs (Sin et al., 2005). Further, CRM enables the firm to create a balance between the customer lifetime value and resources allocated to that customer with the help of data analysis. Moreover, CRM information also helps to determine the extent of personalized services required for certain customer. Eventually, this knowledge permits the firm to derive a business strategy for execution (Chang et al., 2010). These tasks result in increased profitability, higher retention rate, and increased responsiveness (Agrawal, 2004).

2.3.4. CRM capabilities

The capabilities of an organization are represented by the skills and knowledge it possesses to attain and utilize its resources for superior performance (Morgan et al., 2009). These capabilities are usually embedded in organizational processes and enable firms to coordinate their activities effectively (Day, 1994). According to the definition of CRM presented by Payne and Frow (2005), CRM is a cross functional organizational process which focuses on developing customer relationships. Therefore, it can be derived that CRM capabilities are engulfed within the CRM activities that take place in an organization. Morgan et al. (2009) exemplifies CRM capabilities as a set of skills and knowledge used by firms to find customer prospects, maintain relationships with them and leverage those relationships into profits. There are three key CRM activities which signify these capabilities. These include customer interaction management, customer relationship upgrading, and customer relationship win-back (Reinartz et al., 2004). Therefore, CRM capabilities can be classified into three categories including customer interaction management capability, customer relationship upgrading capability and customer win-back capability.

Customer interaction management capability comprises of the skills and knowledge that firms divest for identifying, acquiring and retaining customers. Customer relationship upgrading capability represents the ability of a firm to up-sell and cross-sell offerings to its existing customers in order to gain profitability. Lastly, the expertise of a firm to revamp relationships with lost or inactive customers is denoted by customer win-back capability. Day (2003) highlights that there are three main antecedents which enable the CRM capabilities of a firm. These include customer orientation, customer-centric organizational system and CRM technology. The relationship between antecedents, capabilities and organizational performance is shown in the figure below.

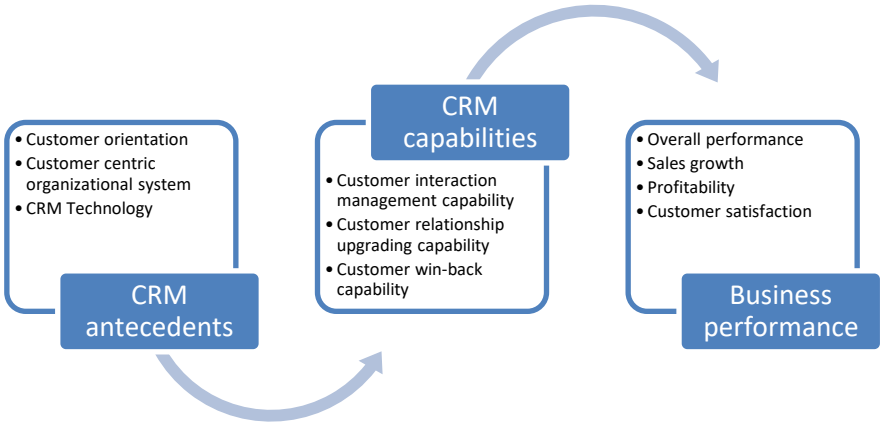

Figure 9. *Relationship between CRM antecedents, capabilities and business performance (Adapted from Day, 2003)*

The figure above shows that the three key CRM antecedents including customer orientation, customer centric organizational system and CRM technology are required to develop CRM capabilities. The firm utilizes these CRM capabilities to improve business performance. Customer orientation refers to the organizational culture that prioritizes customers, customer centric organizational system promotes customer relationship building and CRM technology signifies information technology that enables customer information acquisitions and analysis. Resource based view exemplifies the role of capabilities in enhancing business performance and building competitive advantage (Barney, 1991). CRM capabilities enable a firm to provide superior customer value and support in maintaining a large customer base which results in creation of sustainable competitive advantage (Day, 2003). Moreover, the firms are also able to gain insights about customer needs through these capabilities. This gives them an advantage to respond to customer needs faster with product development or up-selling.

2.4. Customer relationship management systems

The concept of customer relationship management was introduced in the previous sub chapter. This sub chapter focuses primarily on the CRM systems. The definition of CRM,

its offered capabilities and its role in aftersales services is discussed in the sections below.

2.4.1. CRM systems definition

Customer Relationship Management is considerably viewed as an information technology solution that supports the process of developing sustainable relationships with customers (Ang and Buttle, 2006). CRM technologies help to integrate different functions in the organization and present them as a single point of contact to the customer. According to Jayachandran et al. (2005), CRM technology encompasses all the information in an organization which is used to support activities on the front or back end. This includes activities related to customer service or data integration and analysis. Generation of customer knowledge is also a key benefit of a CRM system (Payne and Frow, 2005). These systems provide different kind of support based on their features and functionality. Accordingly, CRM systems can be categorized into three main three categories (Khodakarami and Chan, 2013; Srivastava, 2012). These include operational CRM systems, Analytical CRM systems and Collaborative CRM systems.

Operational CRM systems are targeted to automate customer relationship management processes and improve their efficiency and productivity (Khodakarami and Chan, 2013; Srivastava, 2012). This includes the integration of processes at the customer contact points such as customer service and support systems, sales force automation and field service. Operational CRM solutions are linked with Enterprise Resource Planning systems to extend support from the back-end activities. **Analytical CRM systems** help to analyze the data created on the operational side of a CRM system. The purpose of this analysis is to manage business performance and improvement (Srivastava, 2012). These systems tend to provide a better understanding of a customer's behaviors and needs. The knowledge from these systems can help to identify relevant customer segments and predict purchasing patterns. **Collaborative CRM systems** are intended to assimilate communication channels and customer interaction points in order to facilitate interactions between customers and employees (Khodakarami and Chan, 2013). These collaborative systems consist of website, e-mail and customer portals. A good amount of analytical data is produced through these systems which is analyzed using the analytical CRM. The knowledge gained from the analysis is implemented back to the operational and collaborative CRM technologies for improvement.

2.4.2. Capabilities offered by CRM systems

CRM system is considered as an information technology that supports sales force and service function in an organization (Meuter et al., 2000). On the other hand, it can be also seen as a system which collects, integrates, and provides analysis of customer data (Jayachandran et al., 2005). Day (2003) highlights that provision of CRM technology enables an organization to gather and analyze information about its customers, facilitate interactions between firm and customers, and streamline product or service customization, resulting in a sustainable customer relationship. This signifies that CRM technologies help in the development of customer related capabilities of an organization (Day, 2003). These customer related capabilities are supported by various functionalities found within a CRM system. Some common functionalities found in CRM systems include contact management, reporting and workflow automation (Kostojohn et al., 2011).

Contact Management is one of the basic functionalities found within a CRM system that enables recording and storage of customer contacts as well as all firm-customer interactions that have occurred during the relationship (Kostojohn et al., 2011). This data is then utilized for customer-oriented processes. **Reporting** is a value-added feature of CRM systems that provides insights about business processes and helps in organizational decision making (Kostojohn et al., 2011). Different reports and dashboards provide information on various aspects of these processes. These may include reports related to profitability analysis or customer satisfaction. **Work flow automation** assigns an active participant role to the CRM system in a customer facing business process. This means that the stored information obtained from one contact point is passed on as actionable knowledge for other dependent processes without the need of interference. This ensures integration of the workflow in a way that cross-functional tasks can be accomplished seamlessly (Srivastava, 2012). The handoff of a qualified lead from marketing to the field sales force highlights the significance of this function.

Moreover, Srivastava (2012) has also highlighted some functionalities that are essentially required in a CRM system. These functionalities depict different aspects which result in the development of customer related capabilities. The CRM functionalities include business intelligence and analytical capabilities, unified channels of customer interaction, self-service, centralized repository, cross team collaboration and integration with ERP applications.

Business Intelligence and Analytical Capabilities within a CRM system are required by a firm to leverage and analyze stored customer related information to make business decisions (Srivastava, 2012). Analytics CRM applications provide robust tools for analysis which can be used at different instants. This feature also relates to performance measurement of different processes from the CRM system itself. Complex and automated business intelligence systems would require CRM systems to be linked with modern day concepts such as Internet of things and Artificial intelligence. **Unified Channels of Customer Interaction** involves integration of CRM functions across all customer contact points (Srivastava, 2012). This would ensure that the customer interaction is consistent and efficient within all channels. In this scenario, CRM systems act as a base point which integrate the incoming and outgoing information through all customer touch points. **Self-service** is a novel functionality in CRM systems which enables the customer to look for solutions by themselves (Kostojohn et al., 2011). This functionality allows customers to access required information through CRM systems and perform routine tasks without requiring an interaction with customer service representative.

Centralized Repository for Customer Information serves as a knowledge bank in CRM systems (Srivastava, 2012). Customer information is available in real-time to all customer-facing employees. This information helps the customer service people to understand customer requirements and provide a solution accordingly. **Cross team collaboration** would help all stakeholders from different functions to interact and collaborate on the same platform and share their knowledge to derive a solution for the customer. **Integration with ERP applications** ensures that organizations can perform business intelligence across systems (Srivastava, 2012). CRM system is a front office automation solution, while ERP is a back-office automation solution. The integration of these systems is necessary to relate information and business workflow in the organization (Kostojohn et al., 2011). This integration of CRM with ERP helps companies to provide faster customer service through an enabled network (Srivastava, 2012).

2.4.3. Role of CRM systems in aftersales services

Aftersales service can be termed as a contact experience that takes place between the organization and the customer after the sale of a product. The provision of these services is a key success factor for long-term relationships with the customer (Patelli et al., 2004). Moreover, the performance of these services determines whether the customer is retained or lost by the organization. CRM system is seen as an important tool to make an

impact on these services as it directly influences the firm-customer interaction (Agudelo et al., 2013). The CRM tools tend to automate service business processes associated with customer relations (Torggler, 2012). The customer touch points are integrated around a common view through CRM (Eckerson and Watson, 2000) and the customers are provided support through these touch points based on information from CRM database or back office functions (Torggler, 2012). The figure below demonstrates the relationship between customer touch points with front and back office operations.

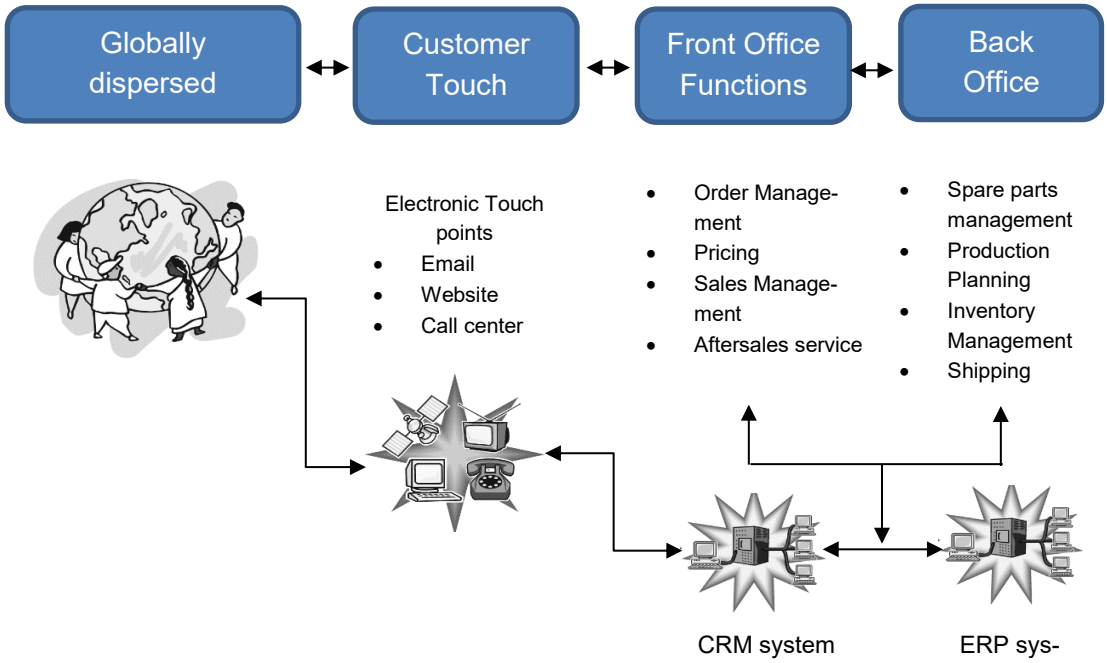

Figure 10. *Linkage between customer touch points, front office and back office through CRM technology (Adapted from Chen and Popovich, 2003)*

The figure above signifies that CRM system establishes a link between aftersales service activities and the customer touch points. The aftersales service activities can be differentiated as front office activities represented by customer service and back office activities such as spare parts management and logistics. These are connected to the company's customer touch points which include phone, internet, email or other communication channels. The required support is relayed to the customer from back office functions through CRM systems. Furthermore, the organizational functions managing front end and back end activities of aftersales service utilize CRM systems to learn from past interactions with customers and optimize the solutions provided (Eckerson and Watson, 2000. CRM systems accumulate, store, maintain, and distribute customer knowledge throughout the organization which provides a complete view of customers. Aftersales service providers can understand data related to customer patterns and behavior and

collaborate on the same platform provided by CRM system to devise a solution for the customer (Torggler, 2012).

Customer service is the most important front-end function of aftersales service because of its significant impact on customer experience. It involves interaction of a firm's representative with the customer. Customer service provides technical and commercial information and services to the customer (Gaiardelli et al., 2007). The motive behind designing and performing this service is to achieve operational efficiency and customer satisfaction. CRM system enables an organization to provide efficient customer service through effective management of the customer support process (Kostojohn et al., 2011). The customer service activities supported by CRM systems are given below.

Helpdesk is the first point of contact for customers within the customer service function (Kostojohn et al., 2011). CRM system helps the company to integrate its customer contact points and automate the workflow of support process. The system records data related to the customer need and helps in directing it to other organizational functions for support. The information regarding status of customer enquiries and data related to all interactions is maintained within the CRM system (Srivastava, 2012). **Complaint Management** is an important customer service activity that drives organizational improvement through customer feedback. CRM systems can help to collect and categorize data related to complaints and enable the automatic management of customer requests (Kostojohn et al., 2011). **Service Requests** are initiated by customers to receive organizational support for their problem resolution. CRM system provides support in the management of these requests from assignment to resolution (Kostojohn et al., 2011). It also acts as a knowledge base for different back office functions to review historical information, share knowledge and collaborate on cross functional issues related to customer solutions. The workflow logic in CRM systems facilitates request escalation within the service group to meet service level agreements. **Service Analysis** includes the performance measurement of services and their associated controlling functions. The analytics capability of CRM captures the data related to services such as response time and resource shortages (Kostojohn et al., 2011). This data can be used to optimize service processes and provide more efficient service to the customers. **Self-Service** is a form of customer support which enables customers to obtain solutions on their own, without interacting with a firm representative. CRM systems provide a platform for customers to access the information stored in CRM knowledge base and find a solution for their issue (Srivastava, 2012; (Kostojohn et al., 2011). This offers a faster and more efficient service experience.

3. RESEARCH METHODOLOGY

This chapter discusses the empirical research methods used for data collection and analysis and the research process adopted by the researcher. According to Saunders et al. (2009), the purpose of this chapter is to provide information to the readers regarding how the research was done and to enable them to evaluate the reliability and validity of the chosen methods. In this chapter, the methods employed for this study are identified in relation to the established research setting. Moreover, the chapter emphasizes on how the empirical data is gathered and analyzed to understand the case company process and research phenomenon and then further used to derive recommendations.

3.1. Qualitative research and data collection methods

Punch (1986) defines qualitative research as an empirical study that generates or uses non-numerical data. The purpose of qualitative research is to develop understanding of how people perceive their social realities and act within the social world (Denzin and Lincoln, 1994). These studies comprise of two important phases, data collection and data analysis. In the first phase empirical data related to the research topic is gathered by using different data collection methods. The second phase of analysis is related to the interpretation of collected data to reach findings or validation of theories. There are various data collection methods for these studies which come with their own strengths and weaknesses (Smith, 1981). Qualitative methods are usually employed in research strategies such as case study and action research because these involve understanding complex phenomena such as change processes (Gummesson, 1993). According to (Gummesson, 1993), there are five methods through which data for research purposes in empirical studies can be collected, these include:

- Existing material
- Questionnaire surveys
- Interviews
- Observation
- Action science

Saunders et al. (2009) explains that these methods are not mutually exclusive, and a combination of data collection methods can be used to validate research findings within

a study. The first method existing material involves the use of includes books, webpages, photos, and statistics to gather data. This method is efficient because data already exists in the form of literature and can be directly used for further analysis. Questionnaire surveys are another effective method of empirical data gathering. These comprise of a set of questions sent out to respondents and help to capture their attitudes and opinions in the form of numbers. Moreover, these are also used to formalize and standardize interviews. Interviews are the most commonly used method for empirical data collection. Interviews are usually more informal compared to questionnaires. Patton (2005) identifies that interviews involve a direct contact with people, and these might reveal some implicit data which cannot be gathered through questionnaires. Observation is the fourth method of data collection which is used in situations where data cannot be easily expressed and put in words. It requires researcher to get associated with the situation. The fifth method action science requires active participation of researcher within a process. This method allows the researcher to affect the process, apply their knowledge and validate findings by applying them in the process.

This study investigates the relationship between CRM capabilities and performance of an organizational function in the case company. Therefore, the research strategy undertaken is case study as highlighted in subchapter 1.4. Moreover, action research is also employed as a part of this case study strategy to iteratively involve people from the organization. Accordingly, multi-method qualitative research was selected as an optimal method to collect data regarding the research topic.

There are two types of data gathered for a qualitative research which includes primary data and secondary data. Primary data is the data particularly collected for the research being undertaken whereas, secondary data is data that was originally collected for some other purpose but can be used in a research being carried out. The primary data in this empirical research is obtained by combining two data collection methods outlined by Gummesson (1993). The use of multiple qualitative methods in empirical research provides an opportunity to reinforce data collection and critically evaluate different data sources (Saunders et al., 2009). Interview and observation methodologies have been used to study and investigate the research topic in real life context. These methodologies and their use in this research are described in the next sections. The secondary data has been gathered using existing materials method. The purpose of secondary data is to enhance understanding about the internal processes of case company. Moreover, this data has also been utilized to derive the research questions of this study and to guide

the research process. Different sources including case company's training material were used to collect this data which provided consistency and conformance in the information.

3.2. Research process

This study was carried out in nine different steps by the researcher. These steps are spread over the timeline from May to October 2019. The figure 11 below shows the research process.

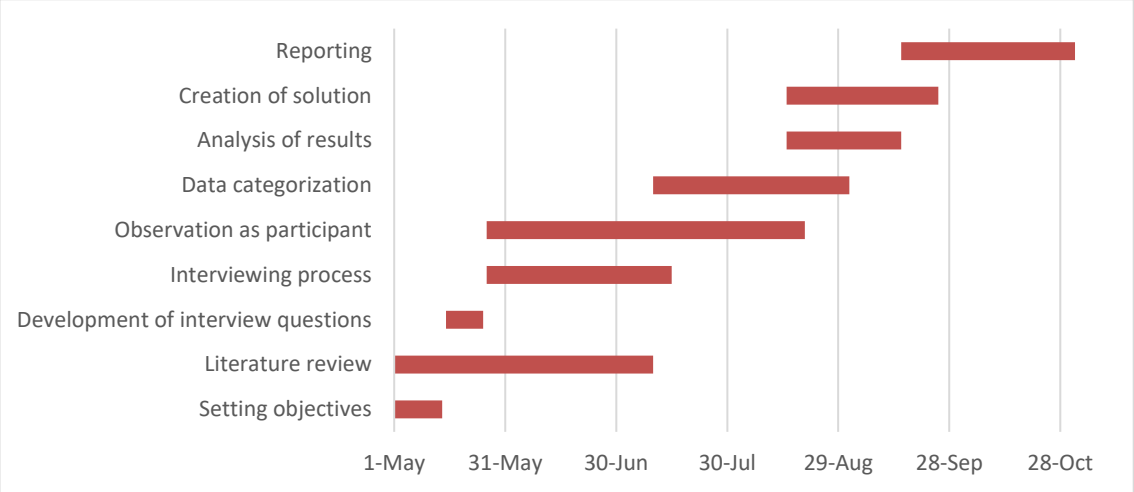

Figure 11. *Research steps*

The figure above shows that the first step in the research process was to set objectives of the study. This was completed in close collaboration with the case company representatives. The second step was based on literature review. This involved review of the existing studies related to the research topic which helped to understand theoretical background of the study. The interview questions were developed in the next stage with the help of study objectives and literature review. This was followed by a prolonged interviewing process. During this research the researcher was working for the case company, so it provided an opportunity to observe the process and CRM pilot implementation. The data collected during interviews and observation was transcribed and categorized for analysis. The categorized data from interviews and observation was analyzed in the seventh step. This enabled the researcher to create solution in the form of recommendations for the case company. The final step of the research process consisted of reporting all the outcomes of the study. The empirical research methods adopted in this study are discussed in the following sections.

3.3. Data collection

The empirical data was primarily collected through conducting qualitative semi-structured interviews and participant observation. The sub sections of this header elaborate each of these methods along with their use and potential concerns in the perspective of this research.

3.3.1. Interviews

The researcher has used one-to-one qualitative interviews to collect primary data for this study. These interviews enable the researcher to understand the rationales behind the respondents' answers. Moreover, this method also develops a mutual understanding between the interviewer and the respondent which elevates collected data quality (Saunders et al., 2009). According to Gill et al. (2008), interviews can be categorized based on level of formality and structure which includes structured interviews, semi-structured interviews and unstructured interviews.

The interviews conducted as part of this paper were designed to be semi-structured. Semi-structured interviews comprise of defined themes and open-ended questions which are used to drive these interviews forward, but these may be altered or left out depending on the interviewee and the flow of the conversation (Saunders et al., 2009). Gill et al. (2008) further adds that it is admissible for the individuals to pursue a specific idea or have in depth discussion on one of the set themes in a semi structured interview. This provides an opportunity for the interviewer to clarify responses and investigate more about the respondent's reasoning for an answer (Saunders et al., 2009). On the other hand, it also helps the interviewer to keep the conversation within the theme of research topic and conduct all interviews with the same frame of questions. The target of these interviews was to understand the current processes and views behind them. The development of the interview structure was a rigorous process which involved a lot of discussion with case company representatives. The interviews were conducted during May, June and July 2019. The interview outline can be found in Appendix A of this paper. The main themes of the interview are mentioned below.

- Background and after sales service process related information
- Reflection on the current collaboration tool being used in the process
- Improvement ideas for the performance of process and current tool

- Opinions about Customer Relationship Management system and its role in aftersales service function

The interview themes stated above were based on research questions formulated at the beginning and the theoretical findings from literature. Moreover, these were also influenced by discussions with the company representatives, thesis supervisor and observations done within the case company. The interview outline was tailored for some interviews from that presented in Appendix A according to the role of respondent related to the aftersales service function. This was done to gain insight from different perspectives.

The main purpose of the interview was to develop understanding about the aftersales service process and the tool being used for collaboration within the function. Moreover, it was also intended to conceive participant input on how this process and tool could be improved. The role of the interview participant was also discussed along with role of other stakeholders. Participants were also inquired about the importance of collaboration tool in their daily work and what capabilities they would like to see in an ideal tool that would improve the aftersales service performance. The performance measurement aspect within the aftersales service function was also discussed. The last theme about CRM systems was optional, and it was discussed only in cases where participant had experience with CRM systems. The questions in this theme were focused to obtain participant's opinion about CRM systems and how these could enable performance in aftersales service function.

The goal of the interviews was to get the views of all stakeholders of the aftersales service process. Therefore, the interview participants were divided into three categories including Global Quotation Support (GQS) interviewees, Customer Service Representative (CSR) interviewees and Expert interviewees. The GQS interviewees were further classified into Team interviewees and Management interviewees. Eisenhardt and Graebner (2007) emphasized that interviewees with different perspectives need to be interviewed to limit the element of bias in the interviewing process. This was ensured by identifying participants for interviewee categories from different organizational hierarchical levels and office locations with the help of thesis supervisor in the case company. Moreover, the sample size was not defined at start specifically and data was collected until significant new information was no longer obtained as referred by Saunders et al. (2009). The interviewees are shown in Table 1 on the next page.

Table 1. *List of interviewees within case company*

Category		Role	Location	Interview type
GQS Team interviewees	1	Team Lead	Newcastle	face to face
	2	Team member	Tampere	face to face
	3	Team member	Tampere	face to face
	4	Team Lead	Tampere	face to face
	5	Team member	Guragaon	online
	6	Team member	Tampere	face to face
	7	Team member	Columbia	online
	8	Team member	Waukesha	online
	9	Manager	Tampere	face to face
	10	Manager	Tampere	face to face
Customer Service Representative Interviewees	11	Manager	Lachine	face to face
	12	Customer support	Perth	face to face
	13	Sales coordinator	Gurugram	online
	14	Parts support executive	Tampere	face to face
	15	Parts support executive	Tampere	face to face
	16	Customer service	Columbia	online
	17	Customer service	Rugby	online
	18	Head of customer service	Tampere	face to face
Expert interviewees	19	Manager Mineral products	Waukesha	online
	20	Manager Aggregate products	Tampere	face to face
	21	Manager Engineered products	Tampere	face to face
	22	Director Classic products	Waukesha	online

The interview requests were emailed to the list of participants mentioned above, along with brief information on the interview scheme, ongoing thesis work and research objectives. Some interviews were conducted face to face, mostly with the participants located in Finland while others were conducted through online calls. All interviews lasted between 30 to 40 minutes. The interviews were recorded with the permission of interviewees and notes were also taken during the interviews. The recordings and notes helped later for transcribing the interviews for further analysis.

There is likely to be a concern regarding the generalizability of findings from the semi structured interviews conducted as these are based on a small sample size. Bryman (1988) states that a single case can encompass examination of several settings and activities. Moreover, if the findings of the research are related to the existing theory then sample size does not hold much significance. The other concern with the interviews conducted is related to the validity and reliability of interview results. According to Saunders et al. (2009), it is important for the researcher to mention reasoning for the choices made regarding research strategy and methods and retain notes related to the research design

and data obtained. These might be referred by other researchers to understand the processes and findings and reanalyze the data collected. Moreover, a combination of data collection methods can also be used which will help to confirm results given by one method as cited earlier in the literature.

3.3.2. Observation

Observation is an empirical data collection method in which the researcher participates in the activities of the group being studied. The purpose of this participation is to record, describe and interpret behaviors in a situation based on what is observed (Saunders et al., 2009). This method is extremely useful when the study requires an in-depth insight of a process or there is a need to capture the interaction between people closely. Observation has been employed in this research to understand different processes related to the aftersales service function, the tool being used in the function for collaboration and to observe the CRM pilot implementation in the aftersales service function. It is worth mentioning that the researcher was employed at the case company throughout the study.

According to Saunders et al. (2009), observation can be classified under two categories, participant observation and structure observation. Participant observation involves qualitative study and focuses on rationales behind human actions. Whereas, structured observation is quantitative and emphasizes on frequency of human actions in a situation. This study is based on participant observation which implies the researcher to immerse in the research setting, share experience with the people being studied and attempt to get to the bottom of the processes (Delbridge and Kirkpatrick, 1994). Gill and Johnson (2002) have developed a matrix indicating different roles that can be adopted by a researcher using participant observation. This is shown in figure 12 below.

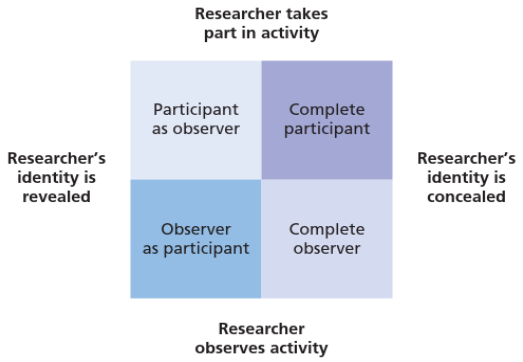

Figure 12. *Possible researcher roles in observation (Adapted from Gill and Johnson, 2002)*

The figure on previous page shows that the complete participant and complete observer roles are the ones in which researchers conceal their identity. On the other hand, observer as participant and participant as observer roles involve revealing the research purpose in the research setting. As a complete participant, the researcher attempts to take part in the activities of the group in which the research is being performed without revealing the identity. The complete observer role differs in a way that the researcher does not get involved in the activities of the group. An observer as participant researcher would only observe the group without taking part in activities but the researcher identity would be revealed to all concerned. In the role of participant as observer, the research purpose is revealed to the group to gain their trust and researcher takes part in activities with the group.

The researcher has assumed the role of participant as observer in this study. This allowed the researcher to gain trust of the group being studied and gain admission to core activities of the process which developed better understanding. Being practically involved in the research setting also provided an opportunity for the researcher to gain user experience with the tool being used in aftersales service function for collaboration and recognize the capabilities required to enable performance. This practical exposure is expected to contribute to the usability of the proposed solution. Moreover, it was possible for the researcher to engage with all stakeholders. During this time, many informal discussions took place between the researcher and interview participants which helped to develop mutual understanding about the process and the collaboration tool. These discussions were favorable to further clarify interview findings and understand the interviewee's answers. Robson (2002) derives that participant as observer role enables the researcher to analytically reflect on the process being studied.

According to Delbridge and Kirkpatrick (1994), there are three types of data generated from participant observation which includes primary, secondary and experiential data. Primary data is the first-hand information related to occurrences and statements which is noted by the researcher directly. Secondary observations are accounts which come through certain observers regarding an occurrence or statement based on their interpretations. Experiential data is data generated through observation based on researcher's perceptions and feelings throughout the process experience. The data in this study has been collected and recorded based on all three categories. This study will use these different categories of data and develop a framework of theory relating key participants, their activities, use of collaboration tool and interactions involved, which will help to understand the research setting more clearly (Robson, 2002).

Like other empirical data collection methods, there are also concerns over participant observation regarding reliability and validity. The data collected from this method is difficult to generalize for other relevant contexts as this involves studying social phenomena (Saunders et al., 2009). The significant threat to the reliability of observation results is that of observer bias (Delbridge and Kirkpatrick, 1994). It is important for the researcher to control observer bias by reiterating the established conclusions through self-questioning. Moreover, the data from other data collection methods such as semi structured interviews should also be compared with the data generated through observations to establish reliability.

3.4. Data Analysis

Qualitative data can be found and collected in many different forms. This data can be made useful by analyzing it and understanding the meaning within it through different analysis procedures. The data collected from the semi-structured interviews in this study was in the form of audio recordings and notes. According to Saunders et al. (2009), this data should be prepared into a suitable format for analysis. The audio-based data from interviews will be converted into word processed transcripts which would be used during analysis.

The research processes including data collection, data analysis and proposition development are interactive and interrelated (Saunders et al., 2009). Analysis is an ongoing process that occurs alongside data collection as well as after it. It helps the researcher to review the data at different instants and modify the direction of data collection if needed. Moreover, the researcher can relate the collected data and establish patterns and themes through the process of data analysis (Corbin and Strauss, 2008).

The transcribed qualitative data can be analyzed through two different processes which include summarizing and categorization (Saunders et al., 2009). Summarizing involves conversion of large amounts of text into fewer words. This enables the researcher to find common themes in the data and identify relationships between them. The subsequent process of analysis involves data categorization. This implies that the researcher derives categories based on theoretical framework and use these categories to group the summarized units of data. This makes the data more structured and allows the researcher to relate these different categories. The analysis further helps the researcher to form and validate propositions around the research questions (Saunders et al., 2009).

The transcribed interviews and data collected during observation are analyzed in this study. Analysis is done with an inductive approach; therefore, the propositions are not pre-defined. The analysis of the collaboration tool and processes of the aftersales service function helps to identify what kind of capabilities are provided by the tool and what kind of functional performance measures exist. The notes from CRM pilot implementation phase were also analyzed along with this. The analysis helps to define relationships between different sets of data and establish various propositions as results. These propositions could be validated based on both theoretical and empirical sources and finally a conclusion can be derived for the research (Saunders et al., 2009).

The process of analysis was ongoing during the data collection phase of this study. The analysis permitted to reframe some of the interview questions to improve the quality of answers from the participants. After the completion of data collection, the transcribed interviews and observation data were reduced into simple statements using the summarizing process as a first step for in depth analysis. The data relevant to the research questions was included in these statements. Moreover, the applicability of these statements was checked by linking them with the research questions. This ensured that only relevant data is made part of the analysis phase. The second step of analysis was based on deriving categories and classifying the summarized data under them. The categories were chosen based on the research questions. The summarized was data was then clustered under each category. This is shown below in table 2 on next page.

Table 2. *Categories for data clustering*

Categories	**Description**
Business objectives and challenges	The business objectives and associated challenges of the aftersales service function.
Required capabilities	Required capabilities to enable the performance of the aftersales service.
CRM capabilities	Capabilities provided by CRM systems that can help to achieve the business objectives of aftersales service.

This helped to provide a structure and classification to the information in turn making the analysis effective. The process steps and the gaps were identified through this method. Observation was focused on verifying statements from interviews and providing insights from the CRM system pilot implementation. The use of two data collection methods also helps to make the data more valid and reliable.

4. RESULTS

4.1. Aftersales service process in the case company

The case company has an expanded installed base of equipment around the globe. It strives to satisfy and retain its customers by providing value added offerings in the form of aftersales services. The key improvement areas in this aspect identified by the management of the case company revolve around "on time delivery" and "inquiry to quote" processes along with improving the in-process customer collaboration. Therefore, Global Quotation Support (GQS) function has been initiated to better meet customer expectations.

The Global Quotation Support function is a designated aftersales service which has been designed to respond to high volume, frequent customer inquiries about spare parts. These customer inquiries are received because of missing or unmaintained information about spare parts in the data management systems. The inquiries are usually related to technical questions or requests regarding price and availability of the spare parts. GQS acts as a single interface to provide support to customers from all market areas through customer service and order desk teams around the globe. Moreover, it collaborates with other functions to find a solution for the customers. The aim of this service is to reduce the quotation response times to the customer by consolidating the process and reducing touch points. The average response time target per request is 1.2 days. GQS enables the company to convert its leads into sales at the same time satisfying customers and retaining profitability. This service ensures that the customers are offered correct spare parts every time at the best possible price.

There are three important stakeholders of the GQS process which includes GQS team, Customer Service Representatives (CSR) and the Experts. The customer inquiries are received by the CSR. These are forwarded to the GQS team when the customer cannot be given a response due to missing or inadequate information to produce a quotation. The GQS team comprising of specialists handles the request and provides the requested information. In the case that information is not available with the GQS team, they collaborate with the network of experts from different functions to find and provide a solution for the customer. This is shown in figure 13 on the next page.

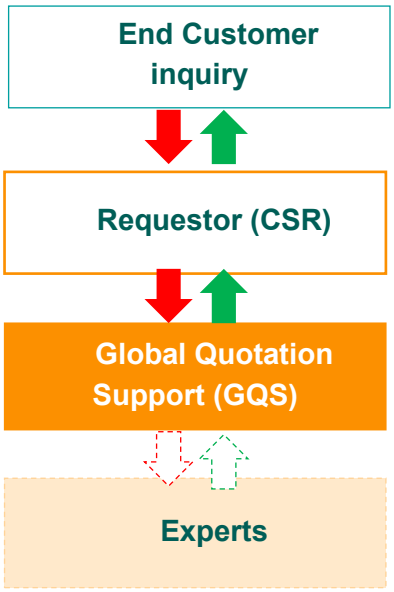

Figure 13. *Global Quotation Support process in the case company*

The GQS team consists of different specialist teams that enable fast quotation processing, including Receiving, Technical support, Cost estimation and Master data maintenance. The requests are handled by each team depending on the type of information required. The GQS team currently uses a request management tool based on Share Point for managing inquiries and collaboration within the GQS process. This is shown in figure 14 below.

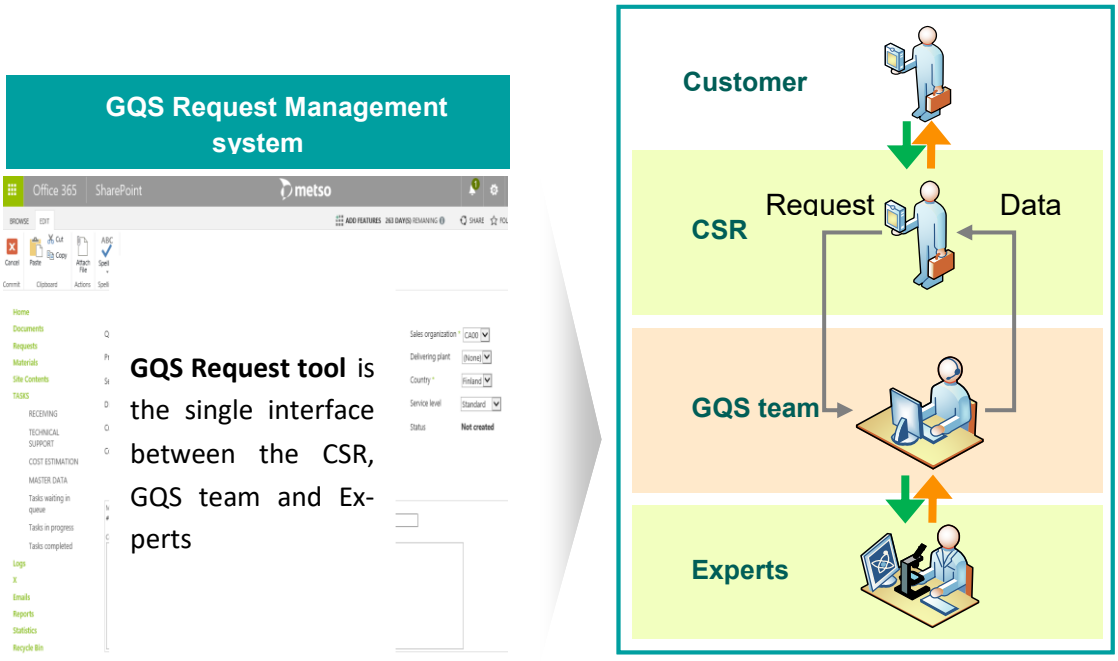

Figure 14. *Global Quotation Support request management system*

The CSR create a request based on customer inquiry within the GQS request management tool. This request takes the form a ticket and is assigned to the GQS team work

queue. The ticket is processed based on the urgency within different teams of GQS. If the GQS team are not able to provide information, then Experts from the product lines are contacted using the same tool. The Experts provide the required solution to GQS which is then conveyed to the end customer via CSR. The request management tool plays a key role in the efficient processing of customer inquiries. However, the stakeholders of the GQS process face many challenges using this tool.

The case company is now in the process of implementing a new CRM system to manage GQS requests which would replace the current GQS request management tool. The motive behind this change is to make the GQS process more capable and adherent to customer expectations. The company conducted a pilot implementation of the CRM system during July-August 2019 within the GQS function. The next sections of this chapter report the findings of this research which include business objectives and challenges of the GQS function, the tool capabilities required for efficient processing of customer inquiries within this function and the CRM system capabilities that would help to enable the performance of GQS based on pilot implementation observation.

4.2. Business objectives and challenges

The first part of the interviews was aimed at obtaining participant insights about business objectives of the aftersales service function and the challenges experienced by the process stakeholders to meet these objectives. The questions were focused on determining the perception about the role of aftersales service function in the organization and the performance drivers of the function. Participants were also asked to elaborate on the challenges related to workflow and request management tool and how these affect the functional performance.

One of the identified business objectives of the GQS aftersales service function was responsiveness. Most of the participants pointed out that the aim of the aftersales service function is to reduce the quotation processing time and provide an answer to the customer inquiry in the least possible duration. The responsiveness depends on the internal lead time of identifying and processing information within the GQS teams and the time taken by experts to provide information to GQS in certain cases. This in turn helps the CSR to process customer quotations faster and win the sale. The CSR participants from Rugby and Columbia explained this in the following manner respectively.

CSR Rugby: *"Timing is definitely critical in our function, sometimes it takes a long time to get information to the customer. We have a 24 hour turn-around time for the standard product quotations."*

CSR Columbia: *"Response times of GQS are critical to enable complete quotations in time to win the sale."*

The second identified business objective of aftersales service was reliability. According to the interviewees, reliability refers to the quality of the solution provided by aftersales service in response to a customer inquiry. The answers signified that responsiveness and reliability go hand in hand. GQS needs to respond with fast but reliable information to the customer. There are two aspects related to reliability of the information relayed to the customer. One aspect relates to the correctness of the offering which means that the proposed spare part matches with the needs of the customer. The other aspect is related to the accuracy of price and lead time information for spare parts which signifies the correct source of the parts and what price they should be sold. Reliable information forms the basis for the customer to make the buying decision and therefore helps to turn quotes into actual sales. A CSR participant from Gurugram made the following comments.

"We contact the GQS to obtain pricing information or to obtain clarification for parts that are requested by the customer. This helps to complete the quotations."

The GQS team manager and the Aggregates products expert in Tampere also illuminated on the reliability aspect of the business objectives of GQS aftersales service. Their statements are given below respectively.

GQS team manager Tampere: *"When customer service does not have correct information available in the system, we provide it in a timely and accurate manner so that there is nothing that holds the order."*

Aggregates products expert: *"GQS really needs to make sure what is the correct offering according to customers machine."*

Some participants also emphasized that the ultimate business objective of the aftersales service was to achieve customer satisfaction and profitability. According to the analysis presented by interviewees, 15% quotations in the company are problematic and cannot

be completed because of missing information in the system. This means that the customers must wait for a longer time to receive the quotes which lowers customer satisfaction. Moreover, there is very less chance for these problematic quotes to be converted into sales which decreases profitability. Therefore, GQS exists to provide support for these problematic quotations to increase customer satisfaction and profitability. The citations of CSR in Lachine and a GQS participant from Tampere are given below.

CSR Lachine: *"Customers find our company as a difficult entity to deal with and they think that the quoting process takes very long. It can be speeded up through GQS in turn making the customers happy."*

GQS team member Tampere: *"GQS covers 15% problematic quotations and the ultimate target is to improve the hit-rate which means converting these quotations into sales."*

To conclude, the business objectives of the aftersales service function have been identified as responsiveness, reliability, customer satisfaction and profitability. The interview answers reflect that responsiveness and reliability are the business objectives evident on the operational level which are linked to customer satisfaction and profitability on the strategic level. The table 3 below concludes the findings related to business objectives.

Table 3. *Findings related to business objectives of aftersales services*

Business objectives of the after-sales service function	Responsiveness
	Reliability
	Customer Satisfaction
	Profitability

Moreover, the interviews also helped to identify the challenges faced by different stakeholders of the GQS aftersales service function and the shortcomings of the current request management tool. There was a consensus among the participants that communication was one of the major challenges that they had to face in their routine work. This included both the internal communication within the GQS process as well as the communication with the external customers. Participants pointed out that the request management tool did not support internal communication completely so sometimes they had to use other channels such as emails or Skype to communicate about the customer inquiry. This leads to the information being missed out or miscommunicated. One of the GQS team participants and the Re-engineered spares manager in Tampere provided the following comments.

GQS team member Tampere: *“We are contacting experts outside the tool to get faster responses.”*

Re-engineered spares expert*: “When using different communication channels, quite often you might lose something important.”*

On the other hand, the customers send their inquiries to CSR who create a request for GQS process in the tool based on that information. There is a communication challenge to interpret and process all the information from the customer and create a GQS request. The participants also highlighted that it is important for the CSR to send correct and complete information regarding the customer inquiry including all previous developments related to the case. If they are not able to communicate this information, then the GQS team would not be able to understand the customer requirement and provide a solution. The classic products director and GQS team member from Waukesha elaborated the situation as given below.

Classis products expert: *“CSRs sometimes miss out or misinterpret customer information when creating a GQS request.”*

GQS team member Waukesha: *“Customers come to us via CSRs not knowing what parts they need or what level they need to order these parts at, sometimes it is difficult to understand what the customer is looking for based on the information provided.”*

According to the reported figures in the case company, GQS function handles 2500 customer inquiries on average in a calendar month. These requests are created by CSRs located in 30 different market areas. Moreover, the requests are related to 14 different types of product hierarchies. The volume and diversity of requests from these figures also confirms that communication could be a big challenge for GQS in meeting their business objectives.

The next big challenge faced by the aftersales service function is the availability of customer related data. The purpose of GQS is to identify and price spare parts related to customer machines. It is important to have details such as machine type, model and serial number to recommend correct spare parts to the customer. In several cases, especially the ones related to classic machines, this customer related information is not provided or is not available. This adds to the delay in GQS responses and affects the

reliability of the information provided. The CSR participant from Gurugram India highlighted this with the following comments.

“Customer information is not always available, and this might add to delay in responses from GQS and pushes our response times.”

Some of the GQS team members also expressed that there are instances where customer asks about a part but does not provide machine details. In this scenario, it becomes difficult to confirm if that part is valid for customer’s machine. The GQS participant from Waukesha who performs technical identification further added that:

“The unavailability of machine related information makes it difficult to identify the correct spare parts.”

Another challenge that was brought up during the interviews was concerned with the workflow management. This is caused by the abundance of manual work in the GQS request management tool. The workflow in the tool needs to be regulated manually between different teams within the GQS process. Furthermore, there is a lot of manual data input involved in the request management tool which consumes more time and increases the chances for human error. The rectification of human errors sometimes results in back tracking or reopening of customer requests which consumes additional time without adding value and affects reliability of the data. The interviewees reported instances where a team member forgot to check an information box or forwarded request to the wrong team because of human error. A GQS team participant from Columbia has specified about this challenge below.

“In some cases, we send the requests back to other GQS teams to rectify the errors due to missing or incorrect data which is extra work for all of us.”

The participants also highlighted that dealing with variety of requirements based on regions was also a significant challenge in their daily work. GQS processes the requests from all market areas around the world. These market areas have their own requirements regarding how the offering should be made and how the lead time and price should be calculated which needs to be considered in every request. This entails the use of extensive passive knowledge in the process. The GQS manager in Tampere elaborated this in the following manner.

“We are a global team handling 30 different locations and each location has their own requirements.”

Furthermore, the process of GQS aftersales service is based on collaboration of different stakeholders including CSR, GQS team and Experts. Experts are a key stakeholder of this process who belong to different functions of the organization. These may include design, procurement, engineering and logistics. Each of these experts have an independent system to work on. Moreover, the GQS team uses the request management tool for their working while CSR use a completely different tool to execute their tasks. This makes it difficult for everyone to collaborate on a request within a single platform. Moreover, the GQS request management tool does not fully support collaboration with all stakeholders. The collaboration mainly takes place through emails which extends response time and affects reliability of the information. The case company documentation reveals that GQS handles requests related to 14 different product hierarchies, which means that GQS must contact 14 different expert groups. Each of these groups have a different working tool and way of collaboration. Therefore, collaboration within the aftersales service function is a big challenge.

Many participants repeatedly mentioned about the challenge related to visibility of the GQS aftersales service process. The interviewees defined visibility as being able to access and share information that is valuable and mutually beneficial. According to the CSRs, after the creation of a request in the tool it is difficult to analyse the progress of the request. Moreover, the CSR are also not able to interpret what is happening in the background of a request. The information is not self-evident in the tool. The GQS team and Experts are not able to see if their proposed solution converted into a customer order and customer was able to implement it successfully or not. The incorporation of visibility in the process will help to understand customer requirement better and communicate the solution to them in a proper manner. Moreover, it will enable learning for all the process stakeholders. The GQS team members from Tampere and Waukesha made the following comments.

GQS team member Tampere: *“Visibility of the process is definitely one of the biggest challenges that limits the performance of GQS. The process stakeholders do not have access to all information.”*

GQS team member Waukesha: *“In a global team, things can get lost easily. Greater visibility will lead to more success and better collaboration within GQS.”*

The results from the interviews signify six main challenges related to the GQS aftersales service function which inhibit in the achievement of functional business objectives. These include communication, customer information availability, workflow management, collaboration, customer requirements variation and visibility of the process. These findings were validated through the observation notes. The figure 15 on the next page summarizes these challenges related to GQS aftersales service function.

Figure 15. *Findings related to challenges of aftersales services*

4.3. Required capabilities

This section of the results exemplifies the capabilities required in the request management tool to enable performance of the aftersales service function and achieve its business objectives. The interview questions were aimed to get insights from the participants regarding the shortcomings of the current request management tool and the capabilities that should be incorporated in the request management tool. Moreover, they were also asked that how these capabilities would support their work and performance.

The most common capability mentioned as a requirement by the participants during interviews was visibility of customer interactions. The need for this capability was also noticed during the observation. This capability entails that the stakeholders of GQS process can get information about the interaction that customers have with different functions in the organization. The reason behind the need of this capability is that customers often collaborate with the product support or engineering for complex part replacements prior to sending an inquiry to GQS for pricing. If GQS do not know about this interaction or

what was decided between product support and customer, then they would not be able to provide correct information and the response would get late. This was explained by GQS participant from Waukesha in the following manner.

"Customer assumes that we know things related to their inquiry as they have had interactions with other functions such as engineering. If we do not have information about these interactions, then we must start from scratch. In that case, we are wasting our time as well as customer's time on something which was already identified with the help of the engineering."

The interview participants further emphasized on the capability of having all possible communication within the tool. This capability will provide a way to ensure that internal and external communications are recorded and remain visible to GQS request handlers within the tool and a log of this communication is maintained to provide support in the request management. Moreover, the interviewees signified that it will alleviate the need to use other communication channels outside of the tool. Also, CSRs can directly send in customer inquiries on the platform without having to interpret them. This would ensure that information is not lost and is visible to all the concerned people involved in the customer inquiry resolution. The GQS team manager in Tampere explained this in the following statement.

"It is important to keep correspondence related to a case in one place so that everyone concerned can get a complete picture of the situation. The tool should provide a way to share and record all this related information."

One of the required tasks of the GQS process is to identify spare parts. The identification of correct spare parts requires that the customer machine information is available to the aftersales service function. Therefore, the capability to keep record of machine installed base within the tool was also highlighted as a requirement during the interviews. Unavailability of this information at first hand increases the response time as well as the probability to provide incorrect information to the customer. If an installed base containing information related to company machines is setup in the tool, it would enable GQS to find correct information quickly and provide it to the customer. The minerals products expert from Waukesha and GQS team member from Tampere commented as below.

Minerals products expert: *"Machine history is critical to derive a solution. In complex cases, we need to see what components are already installed on their machine and what*

changes have they made already. For this, availability of machine related information is important."

GQS team member Tampere: *"There are cases where customer provides limited information about the machine, the ticket goes back & forth to obtain clarifications which is time consuming. Having the installed base data will help when contacting experts."*

Another capability that was conveyed as a necessity by most of the participants was automatic workflow management. The request management tool should have the capability to automatically route requests between teams throughout the GQS process based on defined logics rather than manual assignment by users. Some participants highlighted that this combined with the feature for auto population of fields would reduce manual data input and thus human error possibility. It will also speed up the processing of requests and reduce repetitive tasks. Along with this capability, some participants also identified the requirement to have data integration between the GQS tool and ERP system being used by stakeholders of the GQS process including CSR and Experts. This capability would enable exchange of data between both systems, reducing manual tasks for the request handlers and making the updated available for all stakeholders. The GQS team member from Newcastle and CSR participant from Perth made the following remarks.

GQS team member Newcastle: *If the tool can populate data from SAP ERP automatically then it will reduce our effort to go into the ERP system and validate part numbers and pricing information.*

CSR Perth: *We make our customer quotes in SAP ERP, it would save our time if the price and lead time information provided by GQS gets automatically updated in our quotes.*

In some cases, the GQS team seeks the support from experts when it is unable to find a solution. Some of these cases, require consultation from more than one expert. These experts comprise of specialists working in different functions such as procurement, engineering or product support. They use their own management tools and it is difficult for them to respond to GQS queries faster through emails. Thus, the GQS tool needs to have a capability to allow all stakeholders specifically experts from different functions to be connected through a single platform so that they can assist on a case without any delay. Also, this would help GQS to understand the details behind a proposed solution

so that they convey it to the customer. All interview participants had the opinion that cross functional collaboration is an important capability that needs to be incorporated within the tool. This capability needs to support communication as well as sharing of data and synchronization of activities. GQS Tampere team participant made the following comments when he specified about this capability.

"Everyone working through the same tool whether that's engineering or whoever, we will be able to see the progress right away and clarify things with the experts. This will provide greater visibility ensuring greater collaboration between teams."

According to most of the interview participants, past requests within the GQS tool are very helpful in determining a solution for the customer. There can be two cases, either a similar inquiry was made by the same market area earlier or by another market area which could serve as a reference and help to provide quick solution. Sometimes the CSRs themselves find a solution from these requests. These requests also help in investigating an inquiry and checking the region or customer specific requirements prior to provision of solution. The participants inferred that the GQS request management tool should have a regulated and organized knowledge management capability that would enable GQS stakeholders to look for possible solutions swiftly based on past requests. The CSR participant from Columbia highlighted the utility of this capability with the following comments.

"I have been able to find replacements or pricing information from the previous tickets in GQS tool, since somebody from another country has asked the same question already."

One important aspect of the GQS process visibility is to track and monitor the progress of requests from submission to provision of solution. The participants emphasized on the need to have tracking and monitoring capability in the tool so that they can see what progress has been made for the solution of the customer request and how much time would it take to get an answer to the customer. Also, this would help CSR to identify in time if more information is needed from the customer end to obtain a solution. It is important for the CSR to get this information and provide an update to the customer because they are waiting to order the parts. The CSR participants from Perth and Rugby mentioned about this need in the following manner.

CSR Perth: *"If we have a name of someone in GQS who is handling our request, we can collaborate better and get to know latest progress."*

CSR Rugby: *"My main goal is to monitor and convey the information to the customer as soon as it is completed by GQS. If there is any delay, I need to be informed about what is happening so that customer is made aware of it."*

Performance measurement capabilities were identified as a major requirement by the participants specifically CSR and GQS team. The interviewees pointed out that it is important for them to keep track of the performance of the GQS function as well as their individual performance. The measurement and reporting of different attributes related to the business objectives will help to reflect on the performance aspects. Therefore, the tool should be made capable to make different measurements of the Key Performance Indicators such as response time, customer satisfaction and customer feedback which will provide a basis for improvement. With this capability, the stakeholders within the GQS process can evaluate their performance and deficiencies can be highlighted. The resources and workflow of GQS can be planned better using this information. The GQS team member participant from Waukesha provided the following comments.

"Reporting helps to see what requests are coming through and how quickly are we responding, what improvement do we need."

This section signifies nine capabilities which have been deemed as necessary by the interview participants to enable the performance of GQS aftersales service function. The figure 16 below summarizes these capabilities.

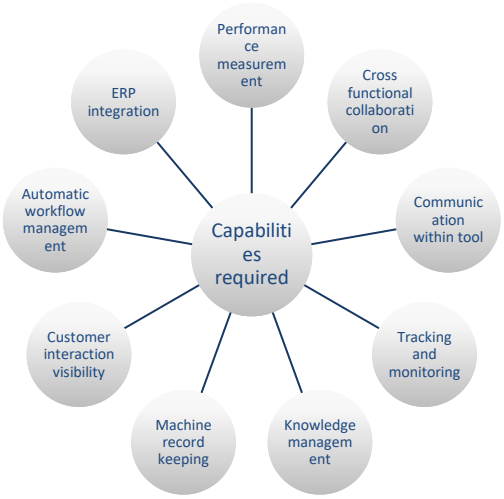

Figure 16. *Findings related to capabilities required by aftersales service*

4.4. CRM capabilities

The key objective of this research is to find out what capabilities are offered by a CRM system and how these capabilities can support the performance of the aftersales service function. The results for this objective were compiled from the participant insights during the interviews and the observation conducted during the implementation of CRM system pilot project in GQS. The CRM system being implemented in the company is Salesforce CRM. There were only a few participants who had practical experience of using this CRM system while others had basic knowledge about it. One of the most discussed CRM capabilities during the interviews was collaboration. Most participants believed that cross team collaboration capability within CRM system would allow all stakeholders including experts, GQS team and CSR to interact with each other within the request and share their knowledge to derive a solution for the customer. The knowledge transfer would be precise, clear and fast ensuring reliable and timely response to the customer. There are numerous features related to this capability which were observed during the pilot implementation. These include exchange of information and documents within the request and possibility to bring other collaborators into requests for discussion. The CRM system also has a communication feature known as chatter which helps all collaborators to discuss issues and make their comments. These comments are saved as a log with time stamps which enhances visibility. Furthermore, emails can also be sent and received from the same tool and the email thread is also recorded and stored in the system with time stamps. The figure below shows the chatter feature of CRM system. This signifies how different people can collaborate within a single platform and invite required people for assistance within the same request. Files can be shared within the same comment boxes.

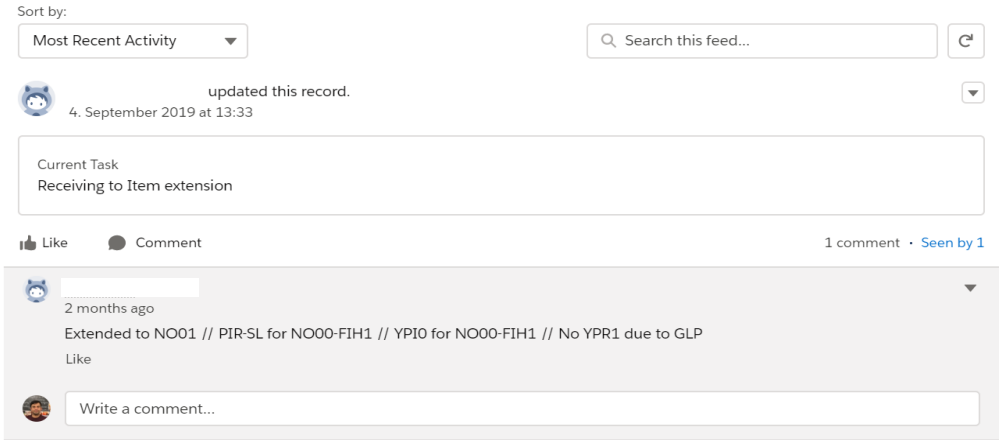

Figure 17. *Chatter feature in CRM system*

Another capability offered by CRM systems is related to case management and automated workflow. This capability was observed during the pilot implementation of CRM in GQS. Case Management refers to the regulated handling of requests within a system until the customer gets an answer. This capability ensures that each customer inquiry automatically and immediately gets to the right team and has the quickest and most accurate resolution. During the pilot implementation, it was observed that the test requests created by CSR were routed to the concerned GQS team automatically. Moreover, in terms of automated workflow management, the manual tasks such as transferring request to another team and case escalation actions can also be automated using CRM which leads to better handling of customer requests. GQS members were able to complete the task and send it to the next required team using guided actions feature during the pilot project. One of the GQS team member participant from Tampere was leading the CRM development activity. He pointed out that repetitive tasks such as manual data entry and updating of case status can be avoided by incorporating macros within the CRM. When a user runs a macro, the system performs each instruction. Macros can help to save time and add consistency in the tasks performed. The figure below shows this CRM capability from the pilot project observation. The Actions and Recommendations feature is part of the automated workflow capability which regulates tasks between teams.

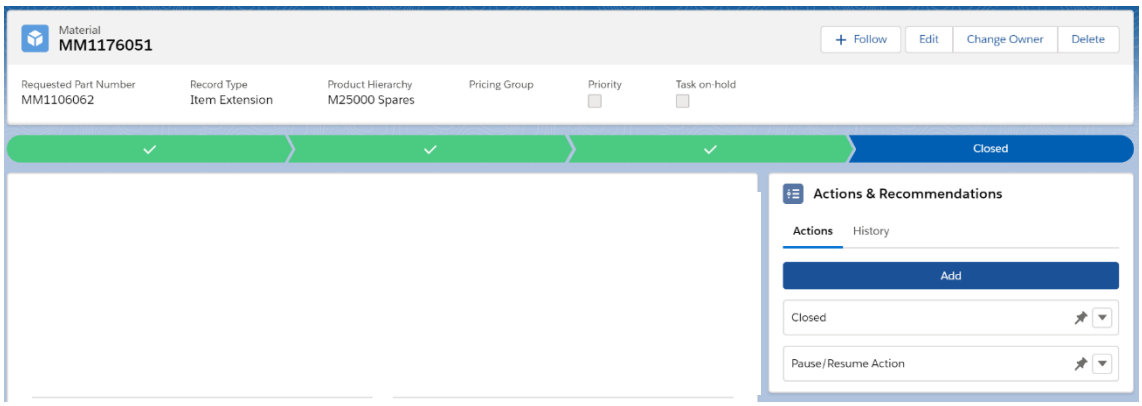

Figure 18. *Automated workflow capability in CRM systems*

CRM systems also offer the capability to track and monitor requests being processed. The CRM system enables better visualization of the process, ensuring that each action is recorded and displayed with time stamps. There are fields which provide information about request handlers and the task being performed related to the request. Moreover, there are also different charts available in the CRM system through which users can see the status of the request, what progress has been made for the solution and they can

derive all sorts of information to provide an update to the customer. During the pilot implementation, it was observed that CRM system allows users to setup personalized dashboards and create customized charts to track and monitor the progress of their requests. The CSR participant from Rugby had prior experience of using CRM system in sales, she made the following remarks.

"I think CRM definitely provides greater visibility. It will allow us CSRs to see everything that is happening on the case and monitor the progress of the case."

The figure below shows an example of tracking and monitoring capability within the CRM system. It provides clear information on the percentage of work completed on given requests. Moreover, a detailed report related to the request status can also be viewed in the background.

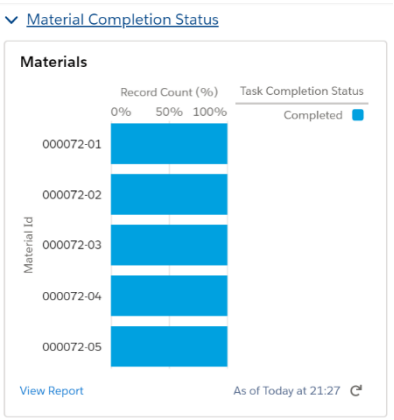

Figure 19. *Tracking and Monitoring capability in CRM system*

The customer inquiry requests that are processed within a CRM system are automatically archived with credentials. CRM systems offer a capability to organize all the archived past data into a knowledge database. This database extracts information from completed requests to be used as an internal or external knowledge resource. It can be linked with key words for better usability. It was observed during the pilot project that every request was stored with a unique identification in the CRM and users were able to find the related request by typing the keywords in search box. According to the GQS team member from Tampere, an additional feature for suggested solutions can be incorporated in CRM systems as a self-assistance option. This feature would recommend different solutions from this knowledge base to the user. The figure on the next page

shows an example of part number search that was conducted in the pilot CRM and how it led to the correct request associated to it.

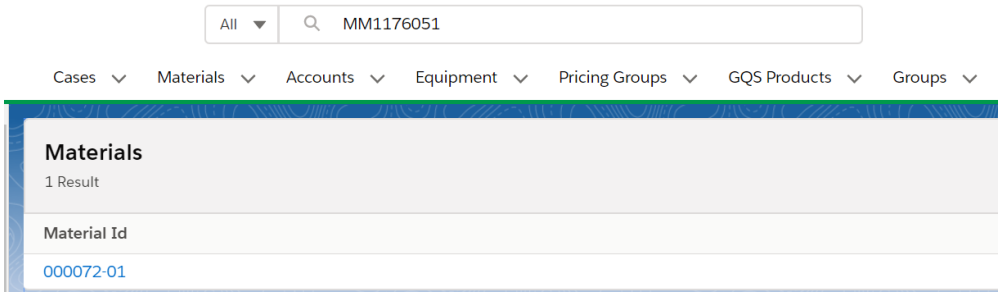

Figure 20. *Knowledge management capability in CRM system*

Contact management is also an evolving capability provided by CRM systems which enables the process of recording customer contacts, sales history and tracking their interactions with the organization. Enhanced contact management allows to see the when and what type of contacts customer has made with a market area or product support. Some participants referred to the customer leads information which is visible in the sales CRM system as an example. This information is useful for other organizational functions to understand the background of a customer inquiry and get to know the needs of the customer. Installed base capability is a part of contact management in the CRM systems which enables the compilation of an organization's products that have been purchased by the customer and are commissioned somewhere at their sites. information such as serial number and purchase date is stored in a directory through this capability. The CSR from Tampere had some previous experience with sales CRM, and she explained the contact management capability with the following comments.

"We have different sales account in the sales CRM that represent customers. There is plenty of data linked to those sales accounts including customer information, machine serials and their commissioned sites. I usually use CRM to enter my quote information so that it is visible to the market area representatives and to the customer."

The CRM systems also offer the capability for data integration with disparate systems being used in back office functions. This means that the data from other systems can be imported into CRM systems or CRM data can be exported to these systems. The most important feature of this capability is integration with the ERP system. The participants provided examples from their previous organizations where they had witnessed this kind of capability which enabled automatic population of data from SAP ERP into CRM. If a

quotation was entered in SAP, it was directly updated and recorded in the CRM. The participants further concluded that this capability provides more visibility from customer inquiry to quotation and sales process.

Reporting and Analytics relates to the performance measurement and analysis capability provided by the CRM systems. Different measurements can be made using the data within the system that offer insights into performance of sales and customer service. This ultimately reflects how a business function is performing. These analytics cover a wide area and include data such as service requests classification and customer satisfaction score. Individual performance measurement is also possible with these systems. CRM offers the opportunity to combine this data into reports which can be used to spot improvement opportunities. According to some CSR participants, they used similar reports from sales CRM systems in their meetings to review customer service performance and customer issues. The measurements and reports can be customized based on key performance indicators of the function. Some of these reports based on request completion time were tested during the pilot project implementation. The figure below shows an example of a typical dashboard within the CRM system. This provides information related to different measured service attributes in the form of visuals such as graphs and figures which helps in analysis.

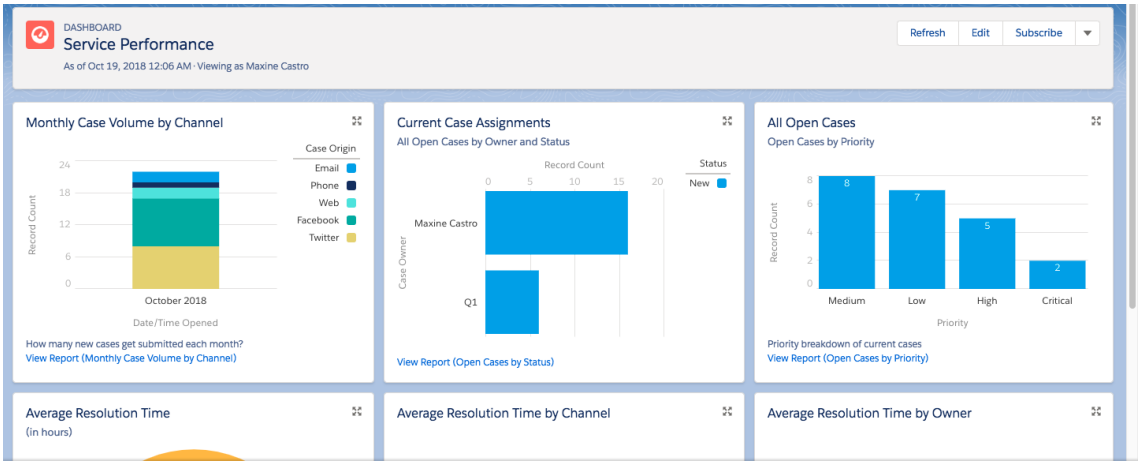

Figure 21. *Reporting and Analytics capability in CRM system*

This section provided an insight to the different capabilities that are offered by a CRM system. The results were compiled based on interviews and CRM pilot observation data. The figure 17 below shows various CRM capabilities that can be utilized by the aftersales service function.

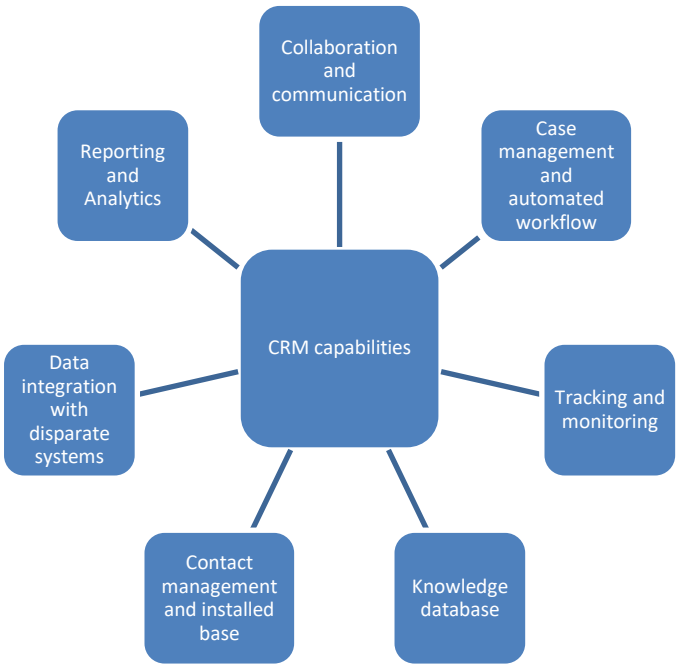

Figure 22. *Findings related to CRM capabilities*

5. DISCUSSION

The purpose of this chapter is to compare and analyze the empirical findings with literature. Moreover, the chapter also includes some discussion related to the findings and outlines recommendations for case company. Researcher's own interpretations of findings are also part of the discussion. The themes specified in Chapter 4 have been reused to classify this chapter.

5.1. Business objectives and challenges

The first objective of this study was to identify the business objectives and associated challenges of the aftersales service function. The rationale behind this was to investigate what directed the performance of aftersales service function and what challenges were faced by the function which inhibited achievement of desired performance. The interviews and observation conducted in the case company revealed that fast response to customer inquiries and provision of reliable information to the customers were the key business objectives of the after-sales service function. These findings are in line with the framework for measurement of after-sales performance presented by Gaiardelli et al. (2007), discussed in the literature review. The framework highlights five performance dimensions at the activity level which include reliability, responsiveness, internal lead times, waste and costs and assets utilization. Gaiardelli et al. (2007) points out that reliability and responsiveness define the performance for front office after sales service activities and this impacts directly on customer satisfaction. Moreover, customer satisfaction drives the financial performance of the company (Zeithaml et al., 2009). The GQS function studied in the case company is a front office after sales service activity and the same motive was reported in the interviews. The participants highlighted that the ultimate business objective of the aftersales service was to satisfy the customers of the company and gain profitability by retaining those customers. It is important to note that after-sales service should not only be considered as a set of operational activities but also as an integrated strategic process (Gaiardelli et al., 2007). Thus, it can be concluded that responsiveness and reliability are activity level business objectives of the aftersales service function which ultimately affect the strategic objectives of the company such as customer satisfaction and profitability. These set of objectives form the basis of capability requirements for the aftersales service function.

The other part of this section relates to the discussion of challenges faced by the aftersales service function. The results from the interviews signify six main challenges related to the aftersales service function in the case company which inhibit in the achievement of functional business objectives. These include communication, customer information availability, workflow management, collaboration, customer requirements variation and visibility of the process. Most of these challenges seem to be related to the customer or the management process of aftersales service function. The theoretical background in Chapter 2 does not classify these challenges explicitly but it provides a reference to servitization challenges in a broader perspective. Considering the literature review, Baines et al. (2009) elaborates that servitization process features very strong customer centricity, where the focus is to offer a tailored solution to the customer and establish a relationship with them. This customer centric nature requires the firms to understand the needs of their customer in order to provide efficient service (C.-H. Tseng, 2016). These citations validate the customer related challenges identified by the interview participants including customer requirements variation, information availability and communication. Moreover, Parida et al. 2014 emphasizes that realignment of organizational structure and processes, and resources is vital to support the new service-oriented focus of a firm. According to the capability view, servitizing firms need to acquire and integrate resources that increase their responsiveness to the changing needs of individual customers (Peppers et al., 1999). This realignment of resources might include developing new customer related capabilities and shedding production-related resources. These findings reflect that the challenges related to process management of aftersales service exist because of resource deficiencies and lack of adherence to the service-oriented approach. From this comparison of theory and empirical findings, it can be inferred that aftersales service is a customer-oriented service process and the case company can address identified challenges by adopting new service focused resources that offer customer related capabilities.

5.2. Required capabilities

The second objective of this study was to establish the required capabilities that can enable the performance of the aftersales service function and help achieve its business objectives. In this aspect, the capabilities that were discussed and recognized by the participants during the interviews and observation are listed on the next page.

- Customer interaction visibility

- Cross functional collaboration
- Machine record keeping
- Knowledge management
- Performance measurement
- Tracking and monitoring
- Automatic workflow management
- ERP integration
- Communication within tool

Most of the participants elaborated that customer interaction visibility and cross functional collaboration are indispensable capabilities for the aftersales service function. The interviewees explained that it is important for them to get information about the interaction that customers have with different functions in the organization to be able to provide correct information and faster response. Also, some customer inquiries require support from various experts who belong to different organizational functions. Therefore, it is essential to have a capability that enables everyone to collaborate for provision of customer solution. The cited literature in Chapter 2 also conforms with the notion of participants. Seuring and Goldbach (2002) derives that aftersales services can involve numerous independent organizations other than the service provider which forms a service network. Customer is also an important stakeholder of this network. A collaborative mechanism is required in the network to satisfy relative goals of all parties. It can be inferred that the term collaborative mechanism relates to both identified capabilities. The compliance between theory and empirical findings reflects that customer interaction visibility and cross functional collaboration have a critical role to help meet the business objectives of the aftersales service function.

Machine record keeping and knowledge management were also signified as some of the key capabilities required for the aftersales service function by the interviewees. The machine record keeping capability is essential to have the customer's machine data available in time. This data helps to know about the customer product and find the correct solution for the customer. It was also emphasized that the knowledge management capability plays a critical role in understanding the customer inquiry and their requirements. This knowledge usually comes from the past requests handled by the aftersales service function and tacit knowledge of individuals. These capabilities can be validated from the theoretical background in Chapter 2 to some extent. Patelli et al. (2004) outlines that one of the objectives of aftersales service is to restore product functionality after failure and resolve customer issues related to product use. This indicates that it is important to have

customer product information in these situations to assist the customers. Moreover, the firms are also required to understand the needs of their customer and retain customer knowledge (C.-H. Tseng, 2016). Knowledge management capability is important for development of the aftersales service and performance improvement (Criscuolo et al., 2007). Hence, it can be concluded that machine record keeping, and knowledge management capabilities are important to enable reliable and timely delivery of aftersales service.

The findings of the research interview and observation also reveal that performance measurement and request tracking and monitoring capabilities are vital for the accomplishment of aftersales service business objectives. The interview participants described that measurement and reporting of different attributes related to the business objectives will help to reflect on the performance aspects of the service. With this capability, the stakeholders can evaluate their performance and deficiencies can be highlighted. Moreover, the capability to track and monitor requests in the tool will help to see what progress has been made for the solution of the customer request and how much time would it take to get an answer to the customer. This capability is important to ensure customer satisfaction. The framework proposed by Gaiardelli et al. (2007) suggests that firms need to measure the performance of aftersales services as these have an integrated relationship with organizational performance. Performance measures are needed to analyse the business results and support decision making (Patelli et al., 2004). There is no direct reference in theory related to tracking and monitoring of customer requests. Although, Brignall et al. (1991) points out that focus on quality and timeliness is the prime feature of aftersales service to satisfy customers. This establishes that it is important to have the tracking and monitoring capability in aftersales service to ensure timeliness. Also, performance measurement is necessary to instigate reliability in the service.

There were three additional required capabilities that were discovered in the interview findings. These included communication, automatic workflow management and ERP integration. The participants stressed on the capability of having all possible communication within the tool. This would ensure that information is visible to all the concerned people involved in the customer inquiry resolution and nothing related to the request is missed out or lost. Another capability that was conveyed as a necessity by most of the participants was automatic workflow management. It was pointed out that the request management tool should have the capability to automatically route requests between stakeholders of the aftersales service process. It will speed up the processing of requests

and reduce chances of errors in the process, making solution more reliable. Some participants also identified the requirement to have data integration between the aftersales service request tool and ERP system being used. The spare parts management function uses the ERP system to maintain products price and availability data. This capability would enable fast exchange of data and accessibility of updated information for all stakeholders. The theoretical background in Chapter 2 establishes some features of the aftersales services which point towards these capabilities. Johansson (2006) perceives that after sales services are a combination of tangibles such as spare parts as well as intangibles related with customer service. These are two different functions of the aftersales service where customer service is the front office function and spare parts management represents the back-office function. According to Dombrowski and Fochler (2017), internal interfaces between customer service and spare parts management are essential for optimum delivery of aftersales service. Moreover, a resilient flow of information between these two functions is required to fulfill customer needs efficiently. It is also evident from the literature review that the main goal of the aftersales service is to make the required spare parts available in an efficient manner, at a suitable price and lead time (Stremersch et al., 2001). This justifies the need to have a communication capability between interfaces of the aftersales service along with automatic workflow management and ERP integration to ensure fast and reliable output. Hence, from the theoretical standpoint, there seems to an endorsement that these capabilities are necessary to enable the performance of aftersales service function.

5.3. CRM capabilities

CRM system is considered as an information technology that supports various functions in an organization. The provision of CRM technology enables an organization to gather and analyze information about its customers, facilitate interactions between firm and customers, and streamline product or service customization. This signifies that CRM technologies help in the development of customer related capabilities of an organization (Day, 2003). CRM system is seen as an important tool to make an impact on aftersales services as it directly influences the firm-customer interaction (Agudelo et al., 2013). The principle objective of this study was to find how capabilities within a CRM system support the accomplishment of aftersales service business objectives. During this research, the capabilities of CRM system were mainly observed during the implementation of CRM pilot project and these were also discussed during the interviews. The key CRM capabilities from the research findings are listed below.

- Collaboration and communication
- Contact management and installed base
- Case management and automated workflow
- Tracking and monitoring
- Knowledge database
- Data integration with disparate systems
- Reporting and Analytics

Collaboration and communication capability of CRM systems was highlighted by most of the participants during the interviews and observation. The participants believed that this capability within CRM system allows all the stakeholders of the aftersales service to interact with each other through a common platform and share their knowledge for deriving a quick and reliable solution. CRM systems allow extensive exchange of information and documents, along with the possibility to bring other collaborators in the system for discussion. There are multiple channels for collaborators to communicate within the system. Moreover, all communication is recorded with time stamps which enhances overall information visibility. The theoretical perspective of CRM also stresses on the cross functional integration. Mithas et al. (2005) points out that the implementation of CRM in an organization ensures effective coordination and integration between different functional units. CRM connects the technological assets, organizational processes, and functions together which helps to collect and share customer knowledge. This integration allows sharing of related knowledge within departments and allocating resources to satisfy key customer needs (Sin et al., 2005). The comparison of research findings and theory establishes that collaboration and communication capability of CRM can be utilized to increase inter functional coordination that would ultimately increase knowledge sharing and benefit the performance of aftersales service.

The CRM capability related to contact management was also signified in the research findings. This capability enables the organization to record customer contacts and their interactions with different functions. It enhances customer support visibility for the whole organization. The information related to customer interaction is useful for organizational functions to understand the background of a customer inquiry and get to know the needs of the customer. Along with this information, the organizations also need to have the updated data regarding their customer machines to provide them a proficient and customized solution. The installed base capability within contact management provides an option to develop and maintain the machines related data such as serial number, date

of purchase and list of installed parts. The cited literature provides a concrete reference to the contact management capability of CRM system. Torggler (2012) highlights that CRM systems accumulate, store, maintain, and distribute customer knowledge throughout the organization which provides a complete view of customers. Moreover, aftersales service providers can understand data related to customer patterns and behavior and collaborate on the same platform provided by CRM system to devise a solution for the customer. Kostojohn et al. (2011) further specifies that contact management is one of the basic functionalities found within a CRM system that enables recording and storage of customer contacts as well as all firm-customer interactions that have occurred during the relationship. Hence, it can be inferred that contact management capability provides information regarding customer interactions. This information helps to understand customer needs and provide them a reliable and fast solution.

Another capability that was highlighted during the interviews and in the observation was related to case management and automated workflow. Case management capability of CRM systems allows efficient handling of customer inquiries from the point of request creation to resolution. This capability enables the workflow to be managed between the teams automatically and it guides the request through different service teams based on required actions. The automated workflow management allows the manual tasks such as case escalation actions to be automated which leads to better handling of customer requests. This capability helps to make the request resolution faster and more reliable as the chances for human error are reduced. In the bigger picture, this capability enhances customer satisfaction. Kostojohn (2011) has elaborated briefly about this capability in his publication. According to the author, CRM system enables an organization to provide efficient customer service through effective management of the customer support process. Service requests initiated by customers are managed through CRM system from assignment to resolution. Kostojohn (2011) further explains that work flow automation ensures integration between cross-functional tasks so that information is passed from one contact point to another as actionable knowledge without the need of human interference. The key takeaway here is that case management and automated workflow capability support the organization to manage their service requests efficiently and provide a timely response to customer in turn enhancing customer satisfaction.

CRM systems also offer the capability to track and monitor customer requests being processed in the aftersales service function. It was evident during the observation that this capability enables all the stakeholders of aftersales service to review and obtain the real time status of a customer request from the system. There are certain features of this

capability including charts, notifications and time stamps which provide information on the progress of a request. This enhanced visibility of the request management process is required to keep the customers informed about the process of their inquiry and monitor process delays. Kostojohn (2011) explains the importance of CRM in customer service and indirectly refers to this capability. The author identifies that CRM system helps the company to integrate its customer contact points and automate the workflow of support process. The system records data related to the customer need and helps in directing it to other organizational functions for support. The information regarding status of customer inquiries and data related to all interactions is maintained within the CRM system. This capability is also considered a part of case management which is why it has not been mentioned specifically in the literature. However, relating the aspect of responsiveness in customer service with the status of customer inquiries, it can be derived that tracking and monitoring capability of CRM systems supports the aftersales service function to maintain its responsiveness.

During the interviews, participants also mentioned about the CRM capability related to organization of past data into a knowledge database. This capability permits extraction of information from completed requests of the aftersales service function into an organized database to be used as an internal or external knowledge resource. This knowledge helps to understand customer requirements and provide a suitable solution for them. Gibbert et al. (2002) signifies that possession of customer knowledge allows the firms to develop customized solution for the customer. Moreover, CRM allows this knowledge database to be utilized as a self-service option. This means that customers can use it themselves to look for a solution based on the question. Srivastava (2012) has denoted these capabilities as centralized repository and self-service. According to the author, centralized repository is like a knowledge bank in CRM systems which provides customer information in real-time to all customer-facing employees. This information helps the customer service people to understand customer requirements and provide a solution accordingly. Also, the organizational functions managing front end and back end activities of aftersales service utilize CRM systems to learn from past interactions with customers and optimize the solutions provided (Eckerson and Watson, 2000). On the other hand, self-service is a platform provided by CRM systems for customers to access the information stored in CRM knowledge base and find a solution for their issue. This functionality allows customers to find required information without requiring an interaction with customer service representative. This offers a faster and more efficient service experience (Srivastava, 2012). The comparison of theoretical and empirical findings can be used to conclude that the knowledge database capability of CRM systems is important

to manage and transfer knowledge within the aftersales function and it would help to improve the reliability of the solution. Self service capability would enhance customer satisfaction.

The CRM systems offer the capability for data integration with disparate systems being used in back office functions. This means that the data originating from various systems can be linked into CRM system. The interview participants mentioned that the most important feature of this capability is integration with the ERP system. This linkage is important because aftersales services often seek support from the backend functions such as spare parts management which use ERP systems. It is important that correct information originating from the back-end functions is directly populated in the CRM system. Khodakarami and Chan (2013) signify that operational CRM solutions are linked with Enterprise Resource Planning systems to extend support from the back-end activities. The framework presented by Torggler (2012) regarding front and back office operations in aftersales service also exemplifies the role of this capability. Integration with ERP applications ensures that organizations can perform business intelligence across systems. The integration of these systems is necessary to relate information and business workflow in the organization. This integration of CRM with ERP helps companies to provide faster customer service through an enabled network. It in turn supports the aftersales service business objectives, responsiveness and reliability.

Reporting and Analytics relates to the capability offered by CRM systems to perform measurement and analysis of the data related to functional activity. This was also one of the capabilities brought up during the research interviews and observation. The CRM system allows to make different measurements for the data within the system that offers insights into performance of aftersales service. Reporting helps to organize the data related to aftersales service process measurements. Analytics part of this capability helps to derive meaning from the measurements to initiate improvement decisions. Aftersales service function may use this capability to measure their KPI such as responsiveness and customer satisfaction. The analysis of these KPI would help to identify improvement opportunities. This capability has also been explained in the literature. Kostojohn (2011) points out that Reporting is a value-added feature of CRM systems that provides insights about business processes and helps in organizational decision making. Moreover, analytical capabilities within a CRM system are required by a firm to leverage and analyze stored customer related information to make business decisions. It can be concluded from the theoretical and empirical findings that reporting and analytics capability is vital to enable sustainable performance of the aftersales service function.

5.4. Recommendations

The objective of this study was to assess how capabilities of a CRM system can help to enable the performance of aftersales service function. The findings of this study were discussed and compared with theoretical background in the previous sections. This section further analyses the findings and provides recommendations for the case company to use the CRM capabilities in their aftersales service function. The practical limitations and implications of these recommendations have also been discussed.

Contact management and installed base capability of the CRM system enables the organization to record the data related to customer contacts and their interactions. The added feature of installed base ensures the availability of data related to machines owned by the customers. This capability can be utilized by the aftersales function in case company to overcome their challenge related to customer information availability and process visibility. Through contact management, aftersales function will be able to get real time information about the interaction that customers have with different functions in the organization which would be helpful to understand customer needs and provide them correct information. Moreover, the availability of machine related data would enable aftersales service to find reliable and customized solution for the customer in a timely manner. They would not need to search for the machine data using other resources. Thus, provision of this capability will reduce response time and increase the reliability of the solution, making the customer satisfied. There are certain limitations to operationalize these recommended capabilities. The machine related data of the case company is dispersed within different databases. This data needs to be linked with CRM systems so that installed base capability can be utilized effectively. On the other hand, it should be noted that contact management capability will provide worthwhile advantage only when all functions within the organization start using the CRM system for all their interactions with the customers. The case company should implement this CRM system in all the key stakeholder functions of the aftersales service process including market areas and expert network.

Work flow management was also discussed as a challenge for the aftersales service function since it involves different functions to work together. The aftersales service function can incorporate CRM case management capability to manage their workflow. This capability systematically manages the handling of customer requests between the concerned stakeholders until the customer gets an answer. The requests would be routed automatically between different teams. The manual actions related to tasks and human

dependency would be considerably reduced. This would enable speedy processing of requests and reduction in human errors. There are no prerequisite conditions or major challenges related to utilization of this capability. Although, user training is critical for successful exploitation because of its novelty. Moreover, some processes which include decision making such as sending emails from the CRM system cannot be automated through this capability.

Another challenge that was specified during the discussion was related to cross functional collaboration and communication. The collaboration capability of CRM system can be utilized to support interaction of all stakeholders of the aftersales service and other organizational functions within one single platform. This would help them to share their knowledge and relevant documentation to derive a solution for the customer. The collaboration capability would provide a way to ensure that all communications are recorded and remain visible within the request. Furthermore, the need to use other communication channels would be alleviated and the dependency on email correspondence will be reduced. The visibility of the information would increase which will help in providing faster and reliable solutions to the customer. The case company needs to implement CRM system in all organizational functions to utilize cross functional collaboration capability successfully. This represents a big challenge. As a first step, the case company should identify key expert network functions for the after sales service and incorporate these functions within the CRM system.

Reporting and Analytics capability relates to performance measurement from the CRM system. Different measurements can be made using the case data within the system. The aftersales service function in the case company uses response time and customer satisfaction as their KPI. They can use the reporting and analytics CRM capability to measure these KPI and then analyze them for performance improvement and business decision making. Moreover, the operational situation can also be gauged using this capability which would help to identify resource deficiencies or bottlenecks in the process. This will in turn help to keep track of service responsiveness and customer satisfaction this supporting the business objectives. There are no significant challenges in the utilization of this capability. The case company would need to design and develop required reports within the CRM system.

The aftersales service function of the case company also faced the challenge concerned with variability of customer requirements. It was identified in the results that the request management tool needs to incorporate knowledge management capability to tackle this

challenge. The CRM system offers a capability related to knowledge database development. This database can be created from the information contained in customer requests processed through the system. The aftersales service can utilize this capability to develop a knowledge resource. This would help to check customer requirements which will reduce aftersales service dependency on tacit knowledge. This would also ensure that the request handlers find the possible solutions quickly and customer requirements are taken into consideration when making the offering. Moreover, this knowledge database can be further developed to be used by customers as a self-service where customers can find possible answers to simple queries. Self-service availability will enhance customer satisfaction as customers would not have to wait for their answers. There are numerous fields within the CRM system where users can share information. Therefore, it will be a challenge for the case company to integrate all these fields and incorporate the knowledge management capability effectively. Moreover, there is a limitation that the knowledge database setup as a result of this capability might not highlight all related data for a certain topic.

The data integration capability provided by CRM systems is also of great importance for the aftersales service function. As there are back end functions linked to the provision of aftersales service, it is important that correct and updated data from the back end is available to the request handlers in aftersales service. The data integration capability of CRM would allow aftersales service function of the case company to be linked with ERP systems being used in the back-end office functions. This would help the correct information originating from the back-end functions to directly populate in the CRM system. It would be easier to relate information against customer inquiry and provide them a suitable solution. Also, the aftersales service can have greater visibility regarding the customer inquiry through linkage to the ERP system. This capability will enable faster and reliable response from the aftersales service. This capability can be utilized in the long term and would need major developments from the case company. The most important requirement is that a link should be setup between ERP and CRM system to enable this data integration.

The CRM system also provides the capability to track and monitor customer requests. This helps to enhance the process visibility from request submission to provision of solution. Various stakeholders of the aftersales service function can utilize this capability and see the progress of a customer request at certain point of time. Customized dashboards and time stamps can be used to review this information. They can monitor delays and communicate with the team regarding escalation actions. This capability in turn helps

to keep the customers informed about the process of their inquiry. Tracking and monitoring capability of CRM systems helps to ensure that the customer requests are completed on time and any delay is reported to the customer. This eventually enhances customer satisfaction. There are no recognized challenges related to utilization of this capability. However, user training is very important for successful application.

The recommendations provided above have been derived based on analysis of the research findings. These recommendations would help the aftersales service function in the case company to overcome their process challenges. Moreover, CRM system could be effectively utilized for the achievement of aftersales service business objectives. The highlighted challenges and practical limitations would help the case company to plan their CRM process better and overcome the barriers in utilization of key capabilities.

5.5. Research limitations

There are some observable limitations related to this research. One of the limitations is related to research findings. This study was carried out specifically on the request of the case company for their aftersales service function in the context of CRM implementation. Therefore, the findings of this research are unique and targeted to support the business objectives of their aftersales service function. Moreover, the research was focused on identifying and recommending CRM system related capabilities that could be used in the aftersales service function. It might be possible that the recommendations regarding CRM capabilities do not solve all the challenges of the function related to achievement of business objectives.

Another limitation is related to the time of study and its possible effect on the findings. This study was conducted during the implementation of CRM pilot project in the aftersales service function of the case company. The findings in the interviews and observation were based on the knowledge gained by participants before or during this pilot implementation. Therefore, there is a likelihood that there might be some other CRM capabilities that are observed after the complete implementation of the CRM in the business function.

It is also worthwhile to mention that the author was employed at the case company during this study which brings another limitation in lime light. This relationship might have helped in the collection of data and better understanding of the case company process, but it might have integrated some inevitable bias while the empirical data was being collected

and analyzed. Furthermore, the empirical data was collected through qualitative interviews which were semi-structured. Some authors consider that unstructured nature of the empirical data reduces reliability. Hence, this limitation may also affect the reliability of results and recommendations.

5.6. Future research directions

The study aimed at providing recommendations for the case company to utilize CRM capabilities for enabling the performance of aftersales service. The objective of the study was achieved but there are some limitations attached to the results obtained. Hence, there is room for future research to validate the findings of this research or explore new areas of study.

One such proposal could be to validate the findings of this research by conducting a benchmarking study involving other case companies. This would provide a chance to view and compare how the CRM capabilities are being utilized in the aftersales function of each of these companies. Also, a quantitative study could be conducted to measure the impact of CRM capabilities on aftersales service. This would include the measurement of customer satisfaction and other related indicators. Moreover, an interesting area that could be further investigated is related to CRM and latest technologies such as Artificial intelligence and Internet of Things. It will be beneficial for the case company to find out how this evolving concept affects the performance of aftersales service.

6. CONCLUSION

Manufacturing companies are turning towards extension of their service business as customer needs become complex and market competition increases. This phenomenon is termed as servitization, which allows manufacturers to create value across the entire product life cycle through provision of services. Aftersales service is one of the prominent strategies adopted by manufacturers in this aspect which is associated with fulfilment of certain business objectives. There are some challenges that arise with the servitization process which hinder the achievement of these objectives. Therefore, it is important for the firms to realign and reallocate their resources to support the new service focused business model. One of the key requirements is to develop new customer related capabilities through resources such as CRM systems and utilize those capabilities for fulfilment of desired business objectives.

The main objective of this study was to find out how the capabilities of a CRM system can aid the performance enablement of aftersales service function in a servitized manufacturing firm. In order to answer this question, the literature was reviewed regarding servitization and its features, aftersales services and their performance measurement and CRM systems and their offered capabilities. The empirical part of the study was conducted in a case company where semi-structured interviews were organized with the aftersales service function stakeholders and the implementation of pilot CRM project was observed.

In the first place, business objectives of the aftersales service function were identified along with the challenges faced by its stakeholders to achieve these objectives. This information formed the basis of the study and led to recognition of capabilities that are required to enable the performance of aftersales service function. Furthermore, the capabilities offered by CRM systems were obtained through the data collection methods. The findings of the research have been compiled in figure on the next page.

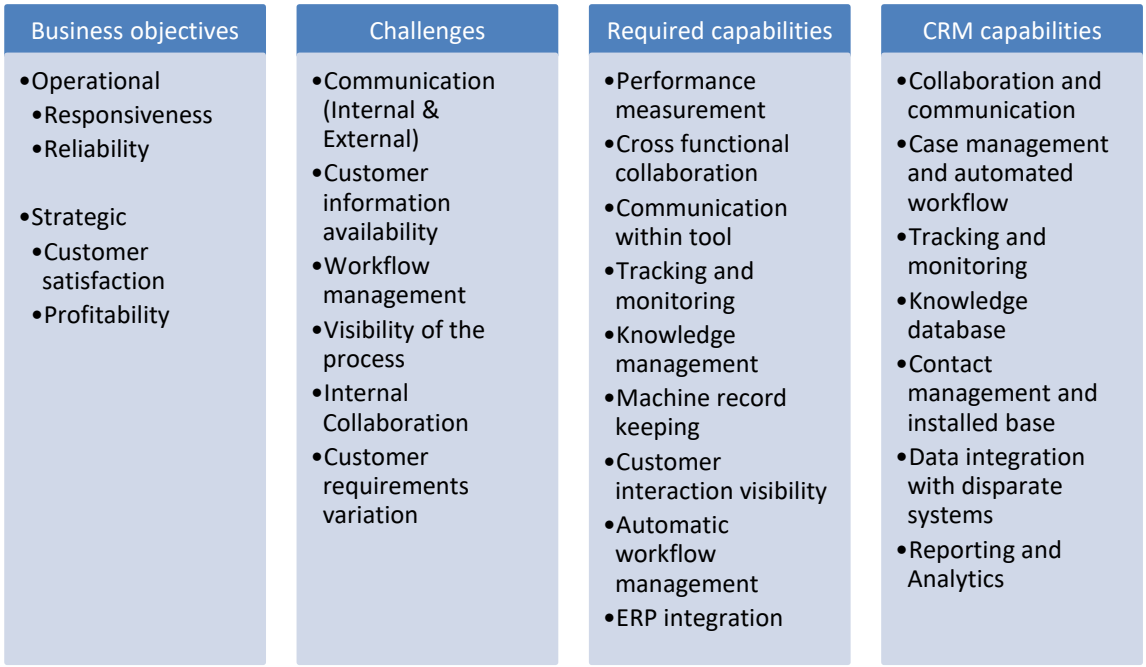

Figure 23. *Findings of the research*

The findings related to aftersales service business objectives, capability requirements and capabilities offered by CRM system were studied. As a result of this study, it was established that various CRM capabilities including contact management, collaboration, case management and reporting and analytics can be utilized to fulfill the required capabilities of aftersales service which will ultimately enable the achievement of business objectives. The recommendations for using CRM capabilities in the aftersales service function were developed for the case company. Along with this, certain challenges and practical limitations related to utilization of CRM capabilities were also signified. Moreover, future research opportunities were also recognized.

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APPENDIX A: INTERVIEW OUTLINE

Interview scheme

Agenda: The discussion session will be focused on the following areas. Questions listed below are not meant to be rigid or to limit the discussion, but they will provide a guideline to proceed in the interview.

Background

- What is your current role / business area / functional responsibility?
- How long have you been working in this role?
- How are you linked to the end customer?

Work related information

- Briefly give an overview of the main activities within your function
- What do you think are the main challenges for your team?
- Do you need to collaborate with other teams? How? (within GQS/CSR/Experts)

Reflection on the current tool

- How does the current share point tool fulfill your work needs and provide value in your work?
- What are the helpful features and the shortcomings?
- Can you reflect on user experience of this tool?
- Do you usually get required information from the tool? What kind of difficulties do you face? Any specifics linked with customer-related information?
    - Different perspectives for CSR / GQS / Experts.
- Is there is enough provision to enter all information that you wish to communicate within the sales support team unto the end customer?
- Is it easy to keep track of the cases you have created or worked upon?
    - Progress
    - Modification
    - Communication
    - Reference
- Does the tool provide required provision for internal collaboration? Do you need to switch between communication channels? Please elaborate.

- Do you think that SharePoint tool plays any role in helping you achieve the departmental targets? (response time/expert network). Would any improvement in the tool help in moving closer to these targets?
- How do you feel about the performance reports originating from the tool? (for Managers)
    - What kind of other measurements would you like to make with respect to performance?

Improvements

- What do you think can be improved in the process, work flow or tool and how? provide examples.
- If you are to add new functionalities to the tool, what would you like to incorporate based on your experience? Please provide practical examples.

Customer relationship management software

- Do you have experience or knowledge about CRM systems?
- How do you think they add / can add value to your work?
- Some questions about CRM functionalities
    - case management
    - activity management – customers history etc.
    - Collaboration
    - Document and File management – customer related documents